

JANESVILLE AREA POINT SOURCE WATER QUALITY MANAGEMENT PLAN

November 1999

Prepared for:

**DEPARTMENT OF NATURAL RESOURCES
BUREAU OF WATERSHED MANAGEMENT**

**JANESVILLE AREA METROPOLITAN PLANNING ORGANIZATION
POLICY BOARD**

Janesville Area Water Quality Management Plan

Prepared by the Rock County Planning, Economic and Community Development Agency, in cooperation with the City of Janesville Planning and Engineering Departments.

November 1999

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All maps in this document are as accurate as the scale will allow. Base maps for areas included in the Janesville Sewer Service Area Plan are kept on file at the City of Janesville Planning Department.

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Chapter 1 - Introduction

The Role of the Janesville Area Point Source Water Quality Management Plan

The City of Janesville water quality plan, or sewer service area plan, is the official citywide water quality management plan for the City of Janesville and its four surrounding townships—Harmony, Janesville, Rock, and La Prairie. The purpose of the plan is to provide a policy framework and set of guidelines to enforce the federal, state, and local water quality programs in the City of Janesville and the surrounding townships. The sewer service area plan inventories land use and environmental conditions in the planning area, projects future land use, and develops a proposed boundary to guide the development of public sewer facilities. The proposed boundary identifies land in the planning area that is most suitable for urban development by providing cost effective public sewer facilities.

In accordance with the directives of the federal law, the state established a continuing area-wide water quality management planning process. This process is described by Wisconsin Administrative Code NR 121, enacted in 1981. The City of Janesville water quality plan is developed as part of the water quality management plans for Rock County as well as major river basins in the region. These plans are reviewed by the Wisconsin Department of Natural Resources (DNR) as part of the statewide continuing water quality management planning process. Though there are many separate plans, the overall goal is to maintain consistency and support between the city water quality plans and the plans of the larger basin areas.

Purpose of the Plan

Sewer service area plans are part of the comprehensive long range planning done by the county, cities, villages, and townships. The plan identifies areas that can be developed to provide municipal services to the communities in a cost effective manner and in a way that protects environmentally sensitive areas. Sewer service area plans serve as a basis for Department of Natural Resources approval of state and federal grants for the planning and construction of wastewater collection and treatment facilities. They also serve as a basis for DNR approval of locally proposed sanitary sewer extensions and approval of private sewer laterals by the Department of Commerce, Division of Safety and Buildings. Environmentally sensitive areas are also identified in the service area plans to serve as a guide for environmental permit decisions by federal and state agencies.

Sewer service area plans are intended to be an important planning and development guide for local communities. The water quality management plan for the City of Janesville primarily addresses the following purposes:

1. Establish the geographic boundaries of a sewer service area for the year 2020 as part of a periodically revised plan requiring updated plans every 5 years.
2. Provide a technical basis to anticipate future needs for wastewater collection and centralized treatment facilities for the planning area.

3. Provide recommendations for solutions to on-site wastewater treatment problems.
4. Serve as a guideline for government involvement in water quality management and establish common goals for developing detailed community plans.
5. Identify areas to be protected from development by designating them as open space corridors. Open space corridors will control and direct the growth of communities in order to protect environmental, social, and economic concerns.
6. Become part of a countywide water quality plan to guide water quality management in Rock County.

The sewer service area plan is used as a planning and growth management tool. It is incorporated into village and city master plans to encourage cost effective growth areas to reduce the expense of furnishing wastewater treatment and other services to areas with limitations for development.

The program was also developed to outline and protect environmentally sensitive areas from indiscriminate urban growth. Such areas include, but are not limited to, wetlands, floodplains, steep slopes, hydric soils and shorelands.

This sewer service area plan update is a formal amendment to the Lower Rock River Water Quality Management Plan (1998). As an amendment, this plan update and any subsequent plan amendments must be in conformance with the water quality goals and objectives described in the Lower Rock River Water Quality Management (or “Basin”) Plan.

Development of the Original Plan

The initial Janesville Area Point Source Water Quality Management Plan was developed in 1984 under the provisions of Section 208 of Public Law 92-500 (the Federal Water Pollution Control Acts Amendments of 1972) and the Federal Clean Water Act of 1977. The original plan was based on the most likely growth alternatives for the City of Janesville and the surrounding townships through the year 2005.

The Janesville Area Point Source Water Quality Management Plan, or sewer service area plan, was approved by the Wisconsin Department of Natural Resources (DNR) in 1984. The sewer service area plan inventoried land use and environmental conditions in the planning area, defined as the City of Janesville and the four surrounding townships—Janesville, Harmony, La Prairie, and Rock (see Figure 3). Based on the most likely growth alternative for the City of Janesville and the surrounding townships through the year 2005, an interim 20 year sewer service area boundary was developed. A copy of the sewer service area plan is available upon request from the Rock County Planning and Development Office.

Limits of the Study

The planning area represents a joint development study among the authorities of the townships, city, and county. Standard planning boundaries for a small city incorporate 1.5 miles outside of

the city limits while larger cities must incorporate a planning boundary 3 miles outside of the city limits. Because of Janesville's size, the boundaries of this study will incorporate 3 miles outside of the city limits.

Updates to the Sewer Service Area Plan

It is intended that the Janesville area water quality management plan should be updated every 5 years. Plan updates are used to modify existing service boundaries according to development pressures. They are also used to evaluate the effectiveness of the previous plan.

The 1984 plan made a distinction between future amendments and updates to the plan. Updates to the plan are intended to address the following components (outlined on pg. 129 of the 1984 Report):

1. A revision of the population and demographic projections for the next 20 year's projections shall be reviewed by the Department of Administration (DOA) per NR 121.
2. A review of housing starts, population densities, household size changes, and urban development trends within the planning area.
3. An assessment of the impact of major land use changes in the planning area.
4. An examination of the significant environmental changes.
5. A review and revision of the goals and objectives of the plan, based on present concepts and needs.
6. A discussion of any social or economic impacts on the area that may affect the area-wide water quality planning efforts.
7. A list and explanation of any interim amendments to the plan that occurred during the previous five years.
8. A revised service area boundary based on 20-year projections.
9. A review of any changes in the constitutional or implementation structure of the plan.
10. An update of citizen participation efforts.

These components will be addressed in the report that follows.

Justification for Proposed Plan Update

Rock County and the City of Janesville propose this update to the *Janesville Area Point Source Water Quality Management Plan*, as revised through the January 1987, April 1994, February 1995,

and January 1997 amendments. This update will include a review and update of the text and map (Figure 3) of this Plan.

The following factors signal the need for an update to the *Janesville Area Point Source Water Quality Management Plan*:

- **The 1984 Plan states that "a comprehensive review and update of the Sewer Service Plan should be completed every five years" (p.129).** It has now been fifteen years since the plan was drafted. A review of the goals, text, and map within the 1984 Plan is overdue.
- **The current sewer service area boundaries are based on outdated projections.** The boundaries set by the 1984 Plan and 1987 amendment were based on 20 year population projections through the year 2000. In 1993, the City of Janesville completed a series of four "base studies" which analyze existing conditions in Janesville and forecast future trends. Based on 1990 U.S. Census Data and a 1990 land use inventory, these studies project growth in population, housing units, employment, and land use through 2015. They form the basis for expanding the sewer service area boundaries.
- **In many areas, particularly on the City's east and northeast sides, urban development is approaching sewer service area boundaries.** Residential, commercial, and industrial development in Janesville have all been at historically high levels since 1990. As a result of the outward growth pressure, the City limits now coincide with or approach the sewer service area boundaries in several locations. This situation (1) negatively affects the City's ability to grow into environmentally and economically appropriate areas, (2) drives up the cost of land within the City, (3) discourages the timely response to development requests on the City's fringe, and (4) encourages some development to occur outside the sewer service area on private well and septic systems.

Chapter 2 – Goals and Objectives

Study Purpose

The diversity of local government interests require that common goals be established for the sewer service plan. Without common goals, the beneficial achievements of one community's action may be offset by the actions of another community. Establishing common goals also assists in developing a history of cooperation that may be emulated in future areas of inter-community activity.

The goals and objectives for the Janesville Area Water Quality Management Plan are designed to address the issues and concerns of local government, county staff, and state agencies that should be met by the sewer service area plan. The goals represent statements of direction for the Janesville Area Water Quality Management Plan. The objectives consist of measurable results to determine if the goal is being attained. The policies that result provide guidelines toward achieving the specific objectives. Policies intended to implement the Plan, and thus achieve the goals and objectives, are further described in Chapter 5.

Goals and Objectives

Goal I. To provide and maintain public utilities and services which efficiently meet the needs of all segments of the community while protecting water resources and the quality of the environment.

Objective 1. By making maximum use of the existing facilities.

Objective 2. By developing efficient water, sewer, flood control, and solid waste facilities in such a way as to protect the quality of the environment, particularly the surface and groundwater resources.

Objective 3. By eliminating conditions created by inadequate sewage collection and treatment facilities which result in potential threats to the health and welfare of the public.

Objective 4. By encouraging future development to locate in areas suitable for development where environmental impacts can be sufficiently mitigated.

Objective 5. By controlling development of areas where environmental problems indicate the development should not take place, especially shorelands, wetlands, areas with high water tables, steep slopes, areas with soil limitations, and areas with unique natural features.

Goal II. To guide the future development of the City of Janesville within the defined urban service limits in an efficient, sequential, orderly, and compatible manner.

Objective 1. By extending urban services to those areas where demand exists within the urban service limits only.

Objective 2. By encouraging a land use pattern which will reduce the length of trips.

Objective 3. By providing sufficient land area in which the future development of the City can be accommodated.

Objective 4. By encouraging utilization of vacant land within the City that is already provided with urban services.

Goal III. To encourage future development, that is outside the urban service limits, to locate in rural transition areas in an efficient, orderly, and compatible manner.

Objective 1. By encouraging development that is consistent with city, town, and county plans.

Objective 2. By encouraging future rural developments to locate in those areas that are suitable for on-site sewage disposal systems.

Objective 3. By encouraging industrial developments to locate on sites having necessary public services.

Objective 4. By encouraging the utilization of existing commercial districts as the primary trade area before providing additional commercial areas.

Objective 5. By working with the four towns in the Janesville Planning Area and Rock County to develop and adopt local development plans that are mutually consistent and compatible.

Goal IV. To promote the conservation of agricultural land.

Objective 1. By encouraging the orderly and sequential extension of urban services, with the intent of preventing the premature development of agricultural land.

Objective 2. By adopting the goals and objectives of the 1979 Rock County Farmland Preservation Plan.

Objective 3. By encouraging higher density development.

Objective 4. By minimizing problems associated with large lot rural subdivisions locating in the urban service limits.

Objective 5. By encouraging future rural subdivisions to locate within the rural transition areas as defined in the Rock County Farmland Preservation Plan.

Objective 6. By encouraging development to locate outside farmland preservation areas.

Chapter 3 – Inventory/Critical Issues

Description of the Planning Area

Rock County is located on the south central border of Wisconsin. Janesville is Rock County's largest city, occupying the central region of the county. The planning area (shown in Figure 2) includes the City of Janesville, and the surrounding townships of Harmony, Janesville, La Prairie, and Rock.

The planning area is located in the "Lower" Rock River Basin, which flows through the City of Janesville, the City of Beloit and then into Illinois, where it ultimately meets the Mississippi River at the Illinois-Iowa state border. The planning area is located in the Blackhawk Creek, Marsh Creek, Rock River/Milton, and Bass Creek (LR03) watersheds.

Since 1984, four map amendments to the water quality management plan have been prepared and approved by the DNR. These amendments are reflected in Figure 3 and described below:

January 1987: In 1986, the City of Janesville approved the Growth Concept Plan as part of its Comprehensive Plan. Based on urban land area need projections and a selected growth alternative, this plan recommended 20 year urban service limits for Janesville. These limits differed somewhat from the interim sewer service area boundaries established in 1984. As such, a map amendment to the sewer service area plan was drafted to make the sewer service area boundaries consistent with the urban service limits established in the Growth Concept Plan.

March 1994: In 1994, Rock County's request for sewer service to the Rock County Airport prompted a second amendment to Janesville's sewer service area. The airport is located south of the city in the Town of Rock. The airport experienced septic system failures and groundwater in the area has high nitrate levels. A map amendment was prepared to add 251 acres of airport property to the sewer service area plus 740 acres of additional lands between the airport and the city limits.

February 1995: In late 1994, the Department of Transportation requested sanitary sewer service to the Interstate 90, Rest Area 17 north of Janesville. The sewer service area was amended to include a 39 acre "limited service area" surrounding this rest area. This amendment also added to the service area a developed industrial parcel north of the city along Newville Road.

January 1997: Development pressure on the north and west sides of Janesville prompted this amendment of 237 acres of land into the sewer service area. This amendment added residential areas between County Highway Y and State Highway 26 and residential areas south of State Highway 11 on the west side of the city.

Current Janesville Area Sewer Service Boundary

The current sewer service area boundary for the Janesville area is shown in Figure 3. It includes the area serviced by the City of Janesville wastewater treatment facility. The current sewer service area incorporates an area that is 36.09 square miles, as outlined by the 1984 sewer service area plan and subsequent amendments. The location of the City of Janesville treatment plant is indicated in Figure 3 as well as the location of the treatment plant outfall.

Population Growth Trends

Population projections are the key factor in the forecasting of urban growth. The trends and forecasts which have been presented, and provide the basis for recommendations in this plan, are based on the projections done by the Department of Administration. They will have to be updated and revised to reflect updated census information and revised growth projections as they become available. Any other population projections used as part of this plan development must be within 10% of the projections made by the DOA in order for the projections to be valid. Table 1 shows the historical population information for the City of Janesville and the four township planning area as compared to the State of Wisconsin and Rock County. The population changes in Table 1 are shown as the average annual percent change for each of the 10 year periods shown.

Table 1
Population and Percent Annual Increase for
Wisconsin, Rock County, City of Janesville and Four Township Planning Area

	State of Wisconsin	Rock County	Janesville	Township Planning Area
1960 Population	3,952,000	113,913	35,164	6,644
1970 Population	4,417,000	131,970	46,426	8,200
% Annual Change 1960-1970	1.1%	1.5%	3.2%	2.3%
1980 Population	4,705,767	139,420	51,071	9,656
% Annual Change 1970-1980	0.6%	0.6%	1.0%	1.8%
1990 Population	4,891,769	139,510	52,210	9,374
% Annual Change 1980-1990	0.4%	0.0%	0.2%	-0.3%

SOURCE: U.S. Department of Commerce, Bureau of the Census

Table 2 shows the population forecasts for the next 20 years in 5 year increments for the City of Janesville and surrounding township planning area, and compares it to population forecasts for the county. The population changes in Table 2 are shown as average annual percent change for each of the 5 year periods shown. It should be noted that any subsequent population projection

Table 2
Summary of Population Projections for Rock County, the City of Janesville,
the Four Townships, and Planning Area

	1990 Census	1997 Estimate	2000 Projection	2005 Projection	2010 Projection	2015 Projection	2020 Projection
Janesville Population	52,210	58,639	60,581	63,293	66,005	68,350	70,695
% Annual Change		1.76%	1.10%	0.90%	0.86%	0.71%	0.69%
Town of Janesville	3,121	2,758	2,876	3,045	3,214	3,364	3,514
% Annual Change		-1.66%	1.43%	1.18%	1.11%	0.93%	0.89%
Town of Rock	3,172	3,067	3,042	2,989	2,935	2,868	2,800
% Annual Change		-0.47%	-0.27%	-0.35%	-0.36%	-0.46%	-0.47%
Town of LaPrairie	943	948	938	918	897	873	848
% Annual Change		0.08%	-0.35%	-0.43%	-0.46%	-0.54%	-0.57%
Town of Harmony	2,138	2,323	2,422	2,564	2,707	2,833	2,960
% Annual Change		1.24%	1.42%	1.17%	1.12%	0.93%	0.90%
Four Towns	9,374	9,096	9,278	9,516	9,753	9,938	10,122
% Annual Change		-0.42%	0.67%	0.51%	0.50%	0.38%	0.37%
Rock County	139,510	148,766	151,919	156,072	160,224	163,513	166,802
% Annual Change		0.95%	0.71%	0.55%	0.53%	0.41%	0.40%
Planning Area	61,584	67,735	69,589	72,809	75,758	78,288	80,817
% Annual Change		1.43%	1.05%	0.84%	0.81%	0.67%	0.65%

SOURCES: Wisconsin Department of Administration, Demographic Services Center

U.S. Department of Commerce, Bureau of the Census

updates by the Department of Administration should be used in the justification of any proposed amendments to the plan or future plan updates.

Residential Development

In addition to population projections, average household size and housing densities (dwelling units per acre) are required to determine residential land use needs. The average number of persons per household represents a typical dwelling unit which can be compared to population projections for estimating the total number of dwelling units added. The average household size for the City of Janesville has been steadily declining and is anticipated to continue to decline to 2.3 persons by the year 2020. The resulting decline in the size of the average household will require new housing to accommodate both the increase in the population as well as the dispersion of the current population. Thus, forecasts for population projections will not be mirrored by a proportional change in new housing construction.

Wastewater Treatment Plant Capacity

Background

This section evaluates the capacity of the City of Janesville Wastewater Treatment Facility (WWTF) on Tripp Road. The purpose of this capacity evaluation is to provide the City of Janesville with updated wastewater treatment process capacities that can be compared to the city's sewer collection system capacity. The evaluation describes the capacities of the equipment in each stage of the treatment process. Plant loadings and performance are also discussed.

The present water pollution control plant was constructed in 1970 and began accepting the full wastewater flow in August of that year. The original design capacity was 16 million gallons per day (MGD) for primary treatment and 10 MGD for secondary treatment. In 1986, the water pollution control plant was upgraded to increase the design capacity to 17.75 MGD for both primary and secondary treatment. In 1997, the average daily flow through the plant average 14.92 MGD with a peak daily flow of 22 MGD.

During the mid-1970's, the City investigated the infiltration/inflow (I/I) problem of the collection system. Approximately 3.4 MGD of I/I was found to be entering the system and repairs were begun in 1980-1981. Approximately 1.7 MGD of clearwater was eliminated as a result of the work. Additional studies and repairs may be necessary to address other problem areas.

The facility was designed to be operated as a secondary activated sludge plant with anaerobic digestion and chlorination. This type of treatment process utilized preliminary treatment, primary treatment, dry solids and liquid solids handling to compliment the secondary portion of the plant. The effluent limitations on this treatment plant are instituted by the Wisconsin Department of Natural Resources. The maximum monthly average BOD₅ concentration is 30 mg/l and the maximum monthly average of total suspended solids (TSS) is 30 mg/l. A process schematic is presented in Figure 4.

Plant Loadings

The present plant design flow projected to year 2005 is 17.75 MGD average daily wet weather based on a projected population of 70,000 people. The plant's design organic loading is 27,740

pounds of BOD₅ per day, 19,403 pounds per day of TSS, 1,716 pounds per day of NH₃N (Ammonia) and 470 pounds per day TP (total phosphorus). The average monthly flow rates and loadings for the past five years are presented in Tables 3 through 11.

Plant Performance

Even with the plant loading operating at near design loads, the plant effluent remained well within its effluent guidelines. This can be attributed to the hydraulic capacity of the secondary portion of the plant and a highly trained staff. Tables 3 through 7 present the influent and effluent data from 1993 to 1997. Average effluent BOD₅ concentrations are presented in Table 8 through Table 10. The influent BOD₅ concentrations have varied during the past five years. Influent and effluent TSS concentrations are presented in Table 8 through Table 10. The influent TSS concentration peaked during August 1995, but otherwise has been fairly stable. Table 11 shows that the average influent flow and BOD₅ have both increased slightly in the past five years 1993 through 1997. Tables 3 through 6 also shows that effluent BOD₅, TSS, and Ammonia have stayed relatively stable. With moderate influent concentrations and flows below its 1985 design, the Janesville WWTF produced an effluent well below its limits. This would lead one to believe that the overall plant projections are on target.

The compliance maintenance report (CMAR) is a good method to evaluate the treatment plant's performance. The CMAR gives each treatment plant a value based on a rating of certain combined aspects of the treatment plant function. Processes that are functioning well within the design range for the plant age are given a value of zero. Processes that exceed the design range are given values that increase based on the number of times that the design range is exceeded. The CMAR values from the City of Janesville's WWTF during 1993 - 1997 are 27, 8, 14, 20 and 41, respectively. The WDNR ranks these values as follows: 71-120 requires department recommendations and anything greater than 121 requires department action. The scores have reflected primarily the age of the plant and the BOD₅ loading rate of the influent. The plant had not received any points for the quality of the effluent within the past five years because the effluent quality has been well within the limits set by the DNR.

Unit Process Evaluations

The unit process evaluation will provide a breakdown of the capacity of each unit process at the City of Janesville's WWTF. The operation of each unit process will be described and the design criteria will also be discussed. The capacity of each unit process is listed in Table 12.

Influent Pumping Station

Wastewater enters the treatment facility with the aid of one of four influent screw pumps. The influent screw pumps are sized to pump with different capacities. These capacities are rated as follows: 72" spiral 9,000 GPM, 78" spiral 13,000 GPM and 90" spirals are 17,000 GPM high run and 12,500 GPM low run. The influent pumps raise the wastewater to its highest elevation in the plant where it will flow through the rest of the plant by gravity. The wastewater will then enter its first treatment called preliminary treatment.

Preliminary treatment at the Janesville Wastewater Treatment Plant consists of bar screening and grit removal. Bar screening is completed using two mechanical bar screens that automatically clean themselves by the use of automatic timers and float switches. The materials captured and removed by these bar screens are then discharged to a belt conveyor which transports the material to a screenings compactor where excess water is removed. The material is then discharge into a dump truck and later disposed of by land filling. The wastewater then proceeds to two aerated grit tanks. The volumes of these tanks are 8,600 cubic feet each. The grit is removed from each tank using grit elevators which lift the grit from the bottom of each grit tank and discharges the grit into a grit classifier or grit washer. The purpose of the grit washer is to wash the organic materials from the inorganic material grit, (de-watered grit) and discharge the grit onto a conveyor belt. The conveyor belt then discharges the grit to the same dump truck used for the screening material and is then land filled.

Primary Clarification

Purpose

The purpose of primary sedimentation is to remove the settleable solids and scum from the raw wastewater. The sedimentation tanks provide a quiescent zone with a detention time ranging from 1 to 2 hours at design flow (17.75 MGD). The tanks are designed to remove most of the particles having a settling velocity greater than the tank's surface overflow rate (SOR). Theoretically, all settleable solids will settle to the tank's bottom before the flow carrying them leaves the tank.

Description

In addition to removing the settleable solids from the raw sewage, the primary tanks also provide for consolidation of the raw sludge and a means of collecting it for further treatment in the anaerobic digesters. The primary sedimentation tanks remove about 30 percent of the BOD₅ and 60 percent of the suspended solids. Removing this material in the primary phase of treatment allows the secondary treatment units to concentrate on treatment of the non-settleable portion of the sewage.

Design Criteria

There are 4 two-bay primary clarifiers. The size of each bay is 120' x 20' x 9'. The total volume of all four clarifiers is 21,600 cubic feet with a total surface area of 19,200 square feet. The total weir length is 1,440 feet. The combined primary influent flow consists of the raw influent flow and the return flow. The return flow consists of final scum return, chlorine tank bridge return, dissolved air floatation, belt press wash water, and skimmings filtrate water. The average BOD₅ removal for 1997 was 32 percent. The average SS removal for 1997 was 60 percent.

Nitrifying Activated Sludge

The activated sludge system at the Janesville Wastewater Treatment Facility is designed to be run in many different modes of operation. The mode of operation at the Janesville plant being run currently is a modified step feed. This mode of operation allows better control of the microorganism ecosystem and allows a more constant F/M ratio throughout the tank as

wastewater flows through the aeration basin. This system consists of five aeration tanks, three final clarifiers and three chlorine contact tanks.

Aeration Basins

The plant has five aeration basins #1A, #1B, #2, #3 and #4. The dimensions of basin #1A and #1B are 170' x 54' x 12' each. The total volume of tanks 1A and 1B are 220,320 cubic feet or 1,647,994 gallons. The dimensions of basin #2, #3 and #4 are 170' x 64' x 20' each. The total volume of tank #2, #3 and #4 is 652,800 cubic feet or 4,882,944 gallons. The total volume of all five aeration basins is 873,120 cubic feet or 6,530,937 gallons.

The plant has five two-speed blowers with auto-transformer reduced voltage starting, to supply air to the aeration basin. The five blowers are rated at 4,150 cfm each with a total capacity of 20,750 scfm.

The evaluation of the aeration basin is based on the standard design criteria, nitrification performance, BOD₅ removal and the control of filamentous organisms. With all five aeration basins in service the total aerobic volume is 6.5 million gallons. The design criteria of a 10-hour hydraulic retention time (HRT) is conservative. Nitrification performance is based on the average time activated sludge solids spend under aeration, called solids retention time (SRT). The design SRT of 8-12 days is acceptable. The BOD₅ removals have been well below the maximum of 30 mg/l.

Secondary Clarification

The activated sludge system also consists of three secondary clarifiers. One of the secondary clarifiers has a diameter of 120 feet and a side water depth of 10 feet. The other two secondary clarifiers have a diameter of 120 feet and a side water depth of 15 feet.

Based on design criteria the Janesville WWTF is designed for a surface overflow rate of 523 gpd/sq. ft. at 17.75 MGD with a detention time of 4.6 hrs.

Historically, the wastewater plant runs with a sludge age of 50 to 60 days with an SVI of 60 to 80 and MLSS of 3,800 mg/L to 4,200 mg/L summer and 4,500 mg/L to 6,000 mg/L winter with a F/M ratio of .02 - .10. The results from using these values resulted in an average BOD₅ of 5 mg/L and an average SS of 4 mg/L for the year of 1997.

Disinfection

The Janesville Wastewater Facility uses a chlorine solution to inactivate potentially harmful (pathogenic) microorganisms. Addition of chlorine in solution form is used because it is a strong oxidizing agent which reacts with and then inactivates living wastewater borne microorganisms. After the effluent has had sufficient contact time for chlorination, the effluent is then dechlorinated through the use of sodium bisulfate. Dechlorination removes residual chlorine and converts it into a nontoxic form. The City of Janesville WWTF has two rectangular disinfection tanks and another circular disinfection tank. The two rectangular tanks are divided into four bays. Each bay is 128-feet long x 9.5-feet wide x 9-feet deep. The volume of these tanks equal

44,776 cubic feet or 327,444 gallons. The circular tank dimensions are 90-feet diameter x 7.66-feet deep. The volume of the circular tank is 48,706 cubic feet or 364,321 gallons. The total volume of all three chlorine tanks are 93,482 cubic feet or 699,245 gallons. A hydraulic retention time was calculated to be 61 minutes at 17.75 MGD using the volume of all chlorine tanks, channels and interconnecting piping. The chemical feed system consists of two vacuum operated chlorine solution feed chlorinators, two automatic chlorine gas regulators, one scale and two 2-ton chlorine cylinders.

The dechlorination system consists of two metering pumps and two sodium bisulfate storage tanks 2,400 gallons each. Both the chlorination system and dechlorination systems are run in a flow proportional mode of operation. This system maintains a very accurate supply of both chemicals as the demand changes.

The City of Janesville WWTF is required to disinfect the effluent from May 1 through September 30.

Anaerobic Digestion

Anaerobic digesters receive and digest waste solids generated at the treatment plant. Digestion of these materials reduces their organic content, decreases odors, reduces the overall mass, and makes the sludge suitable for land application.

The anaerobic digestion process at the City of Janesville consists of one 70-foot diameter tank with a side water depth of 22.4-feet and another 85-foot diameter tank with a side water depth of 28.8 feet. The volume of the 70-foot digester is 644,816 gallons, the volume of the 85-foot digester is 1,222,423 gallons for a combined volume of 1,867,240 gallons. There is also a secondary digester that consists of a 70-foot diameter tank with a side water depth of 22.4-feet tank has a volume of 644,816 gallons. The basis for evaluating the capacity of this process was a minimum SRT of 15 days at a loading rate 0.073 pounds of volatile solids per cubic foot per day. Based on these parameters, the estimated anaerobic digester capacity is an influent flow rate of 13.5 MGD corresponding to an influent BOD₅ loading rate of 19,970 pounds per day.

Sludge Thickening

The sludge thickening process uses a dissolved air floatation thickener (DAFT) to remove excess water from the waste activated sludge prior to digestion.

The City of Janesville has two thickener tanks that are 76-feet long, 18-feet wide and 10.5-feet side water depth with a volume of 14,364 cubic feet each. Each million gallons of influent wastewater is assumed to produce about 845 pounds of volatile solids and 1,040 pounds of waste activated sludge. Using this criteria, the capacity for thickening waste activated sludge is 23 MGD.

Sludge Storage

The City of Janesville operates equipment to de-water and then landfill liquid sludge. This disposal method was approved by WDNR in the City's 1983 facility plan. Since this method is

available and a functional disposal method, it is considered a substitute for sludge storage requirements.

Treatment Plant Capacity

The capacity of the treatment plant is defined by the unit process that has the smallest capacity. The capacity of each unit process is presented in Table 12. The secondary clarifiers have the smallest capacity at 17.75 MGD. Therefore, the City of Janesville's Wastewater Treatment Facility has a capacity of 17.75 MGD. An analysis which estimates the impact of proposed development within the updated sewer service area to the Janesville Wastewater Treatment Plant is included in Appendix A.

Environmentally Sensitive Areas

Protecting water resources for ourselves and future generations is the primary reason for preparation of the sewer service area plan. To accomplish this, identification of “environmentally sensitive areas” or areas where development would have a more adverse impact on water quality are identified. Unchecked development within these environmentally sensitive areas would lead to serious degradation of inland waters. By limiting development within these areas the quality of our water resources can be maintained. Therefore, the Janesville Sewer Service Area Plan sets forth the following definition of environmentally sensitive areas found within the planning area.

“Environmentally Sensitive Areas (ESA’s) are geographic areas which encompass especially valuable natural resource features such as lakes, rivers, streams, wetlands, and their associated undeveloped shorelands, floodplains, hydric soils and areas of steep slopes, which should be protected from intensive development. In addition, all isolated, naturally occurring areas with slopes 20 percent or greater shall be considered environmentally sensitive areas.” Figure 6 identifies the location of these environmentally sensitive areas.

Intensive uses to be considered for exclusion from within ESA’s include but are not limited to: permanent structures such as residential, commercial, or industrial buildings; impervious surfaces such as parking lots and concrete or asphalt surfaced storage areas; and site disturbing activities such as extensive clearing, grubbing, grading and filling.

The plan recommends that sanitary sewers not be extended into ESA’s for the purpose of accommodating intensive uses. It is recognized, however, that in some cases it may be necessary to construct a public street, sanitary sewers or other necessary public utilities through or across the ESA’s to serve adjoining or other properties. Such improvements would be required in order to protect the public interest and provide adequate delivery of public services.

Uses which may be considered compatible with the protection and preservation of Environmentally Sensitive Areas include, but are not limited to, non-intensive recreational facilities such as trails, picnic areas, athletic play fields, boat launches, golf course fairways, etc.; in certain instances, utility facilities such as sewer and water lines, detention basins, and stormwater drainageways; and limited clearing, grubbing, grading and filling.

Specifically, the following natural resource based criteria and guidelines are to be utilized in the identification and delineation of Environmentally Sensitive Areas. These standards are depicted in Figure 7.

- All lakes, ponds, rivers and streams identified on the U.S.G.S. quadrangle maps shall be designated as Environmentally Sensitive Areas. All such waterbodies shall be considered navigable until such time as an official field determination by the Wisconsin Department of Natural Resources indicates otherwise.

- The Environmentally Sensitive Area associated with an identified lake, pond, river or navigable stream shall extend 75 feet beyond the ordinary high water mark. In addition, if steep slopes (slopes 12% or greater) are present within this 75-foot wide area, and extend outward from this area, the ESA boundary will be adjusted to include such slopes.
- Any Environmentally Sensitive Area associated with a non-navigable stream or drainageway shall extend 25 feet from both sides of the center of the channel. While every effort should be made to protect non-navigable streams, in certain instances it may be necessary to modify natural drainageways to construct utilities and other public facilities, such as streets, in order to accommodate storm drainage and vehicular and pedestrian traffic.
- All wetlands 5 acres or more in size and identified on the Wisconsin Wetlands Inventory maps shall be designated as Environmentally Sensitive Areas. In addition, if the base of steep slopes (slopes 12% or greater) are present along the wetland perimeter, and extend outward from this area, the ESA Boundary will be adjusted to include such slopes.

It should be noted that the Environmentally Sensitive Areas shown in Figure 6 provide a general representation of environmental features existing within the plan area at the time of map preparation. Because those physical features may change over time from natural or human causes, it is important that the presence and location of wetlands, streams, floodways, steep slopes, and other similar features be verified prior to any land disturbing activity. In addition, specific ESA boundaries within the sewer service area should be delineated and established at the time of subdivision plat or site development review.

Determination of Non-Developable and Developable Areas

Within the planning area there are a variety of conditions that act as control mechanisms on development. The effectiveness of these conditions range from legal restrictions that direct specific requirements, to minor influences that have little effect. In order to direct community expansion, some of these conditions can be applied as policies by the governing agency.

Future land use can be directed based on the following categories:

- Growth prohibited areas due to regulation restrictions or physical limitations.
- Areas where growth is controlled through existing or proposed local and state laws.
- Areas where growth should be discouraged due to construction difficulties that result in substantial additional costs, or physical problems.
- Areas where growth should be encouraged due to cost-effectiveness and present acceptability.

Areas Where Development is Prohibited

Wetlands. Wisconsin State Statute 23.32 defines wetlands as “an area where water is at, near, or above the land surface long enough to be capable of supporting aquatic or hydrophytic (water tolerant) vegetation and which has soils indicative of wet conditions (hydric soils)”. For this report, the statutory definition of a wetland will be used. Examples of wetlands are open and wooded swamps, shallow and deep water marshes, wet meadows and prairies, and ephemeral ponds.

These wetlands are important for groundwater recharge and discharge and often provide habitat for a wide variety of plants and animals. Wetlands also provide natural open space, reduce flood peaks and help maintain both surface and groundwater quality. The functional values of wetlands include: active and passive recreation, stream and lake buffer areas, pollutant trap, groundwater recharge, wildlife and fisheries habitat, and maintenance of stream base flows.

In general, any development in a wetland destroys valuable ecosystems, adversely affects surface water drainage and alters the quality of groundwater supplies. In addition, specialized construction techniques must be used when building structures, roads, and sanitary sewers in wetland areas. If these more costly specialized techniques are not used, recurring problems with frost action and infiltration of groundwater can reduce the effective life of the structures.

Through the State of Wisconsin’s shoreland-wetland zoning regulations and mapping program, development in wetlands of 5 acres or more outside the City of Janesville has been made illegal. The Wisconsin Department of Natural Resources has identified all locations of wetlands greater than 2 acres within the city and the townships. The City of Janesville has developed an ordinance that regulates development within the delineated wetlands 5 acres and greater. Although construction practices are prohibited, wetlands are not “useless”. Such areas can serve a variety of needs through conditional use statutes without being developed or damaged. For instance, construction of roads, sewer, water and other utilities, as well as recreational facilities may be installed in these areas, subject to compliance with the provisions of chapters 30 and 31 Wis. Stats., and NR 115 and 117 Wis. Admin. Code.

Shoreland zoning regulations require counties to protect wetlands in the shoreland zone that are 5 acres or greater in size. Counties may choose to regulate down to 2 acres at their discretion. Shoreland-wetland zoning maps delineating wetlands in the planning area are kept on file at the Janesville Planning Department.

Existing delineated wetlands in the planning area are shown in Figure 8.

Floodplain. Construction in the floodway portion of the floodplain of any major drainageway is currently prohibited or regulated through existing Wisconsin Statutes and local ordinances. The floodway is the channel of a river or stream and those portions of the floodplain adjoining the channel required to carry the regional flood discharge. All

floodplain areas have been removed from potential development areas. However, much of the flood fringe in the developed area has been developed so the floodway is the area shown in these cases. Public utilities, streets and bridges can be extended in floodplain areas, however, they must comply with all state and local regulations. (Outlined in Wisconsin Administrative Code NR116).

Hydric Soils. Soils types with a high water table exhibiting a saturated condition at or near the ground surface are generally characterized as hydric soils. The presence of saturated soil conditions may restrict the installation of building foundations and subject basements to seasonal wetness and flooding. Development on hydric soils increases the likelihood of surface and ground water contamination within these areas. Hydric soils are defined as soils that have the following soil map units as indicated in the United States Soil Conservation Services Publication entitled Soil Survey of Rock County, Wisconsin. Locations of these hydric soils in the planning area are shown in Figure 9.

Ad	Aw	AzA	BmA	Br	Co
Da	ElA	EmA	EoA	Ha	Ho
KaA	LkA	Ma	Mb	Mc	Md
Me	Mf	Na	To	Pa	Rs
Se	Wb	WcA			

There may be isolated areas with hydric soil characteristics which may be appropriate for limited development. Such areas maybe developed following detailed analysis by soil experts and through implementation of appropriate construction techniques.

Existing or Proposed Greenbelts. Greenbelts are typically assumed to only provide a natural open area or park use. However, in addition to the aesthetic and natural benefits of maintaining greenbelts, they also serve essential purposes. The natural drainageways established as greenbelts route storm water out of developed areas with a minimum of adverse effect and at a nominal cost. This stormwater routing technique can keep storm sewer construction at a minimum. Property design of these preserved areas will reduce erosion and prevent damage to developed areas. In addition to a utility easement, the natural gradient of the drainageway provides an economical location for gravity interceptor sewers.

Slopes Greater than 20 Percent. Areas with steep slopes (greater than 20 percent) have been identified as developmentally limited areas. Construction activities on steep slopes typically require more site preparation and earth work, and can result in severe erosion and sedimentation problems if adequate drainage facilities and revegetation practices are not completed in a short period of time. This erosion deteriorates the water quality and can result in increased property damage downstream. The Blackhawk Creek, Markham Creek, Fisher Creek, Marsh Creek and Rock River are recipients of this runoff from development. The water quality of these rivers and creeks provide both recreational and aesthetic benefits that are an integral part of our quality of life.

The Janesville sewer service area plan identifies slopes of 20% or greater as environmentally sensitive areas where sewer development should not occur. No land disturbance activities are allowed on slopes of 20% or greater except for access roads or installation of utilities to building sites of less than 20% slope. Development of lands having slopes of at least 12 percent but less than 20 percent, which are proximal to streams or other environmental features, should also be considered for designation as environmentally sensitive areas and excluded from development. Areas with steep slopes in the planning area are shown in Figure 10.

Areas Where Development is Controlled

Shorelands. Local County and Municipal Ordinances outline the potential uses of shorelands. Such controls are necessary to prevent any adverse affect of the natural waterways. If properly administered, conditional development can occur.

Soil Conditions for Private Septic Systems. Through existing State and County regulatory agencies, development on soils that are unsuitable for private waste disposal systems is avoided. This will prevent homes outside the city limits from being constructed on unsuitable soils and later requiring annexation for sewer connections due to failing septic systems. Such connections are often more expensive when trying to design around existing unplanned development.

Local Zoning Uses/Restrictions. Although local zoning ordinances attempt to regulate uncontrolled growth, public needs significantly influence final land use. Local zoning can be altered if the change is warranted and authorized by the local governing agency.

Flood Fringe. The flood fringe is that portion of the floodplain outside of the floodway, which is covered by flood water during the regional flood. Development within the flood fringe portion of the general floodplain district must comply with local standards for development in those areas, and any other ordinance or other state or federal regulation/permit affecting such lands.

Slopes of 12 to 20 Percent Outside of Designated Environmentally Sensitive Areas. In order to protect the planning area's lakes, rivers and streams from excessive stormwater runoff, this plan calls for the City of Janesville to review and approve erosion and sedimentation control plans for an entire developing site and/or plat when slopes of 12% or greater exist. Those lands should be developed in accord with standards for development that address erosion control, minimum lot size/building area requirements, vegetation removal, and site specific grading plans. The plan recommends that the following criteria be further researched, evaluated and forwarded to the Janesville City Council for implementation in order to regulate development in areas with slopes ranging between 12 and 20 percent:

- Larger minimum lot sizes.
- Buildable area requirements for each lot of 16 percent or less in slope, containing at least 20 percent of the lot area or a minimum of 4,000 square feet of contiguous area, whichever is greater, constituting buildable land. Areas of required setback would be excluded from those calculations.
- Required submission of an erosion control plan during initial plat development and then again at the building permit stage.
- Cutting/site clearance plan approval at both the initial subdivision plat stage and then again prior to the issuance of individual building permits.
- Site grading plan approval prior to construction on each lot.

The appropriate manner in which to implement these provisions is through the city subdivision ordinance. While the above provisions provide general development guidelines, detailed criteria shall be developed and proposed for adoption as part of the city's subdivision ordinance. The subdivision ordinance provides the city with "extraterritorial plat review jurisdiction" which encompasses the unincorporated area within three miles of the city limits. Therefore, adoption of an amendment to the subdivision ordinance would subject all lands within this jurisdictional boundary to those ordinance provisions, not just those within the Urban Service Limits.

Due to land contouring and other physical land disturbance activities, areas of man-made slope in excess of 12 percent exist throughout the planning area (i.e. landscape features/berms, gravel pits, etc.). Only areas of naturally occurring slopes would be subject to the development criteria as recommended by this Plan.

Areas Where Development is Discouraged

Agricultural Preservation Areas. It is always undesirable to take valuable farm land out of production. However, due to changing property values, urban pressures often outweigh agricultural demands. Unfortunately, almost all of the property available for development in the planning area is prime agricultural land. Although growth would ideally be discouraged, obviously some concessions will be necessary.

Areas with Construction Problems Not in Prohibited Areas. Construction problems translate into additional costs; costs that are absorbed by the person developing a property and by the entire service area through high utility costs. Although these areas will be somewhat naturally controlled through additional costs, the developer may feel that these costs are justifiable. Even with discouragement, undesirable growth may occur.

Areas Where Development is Encouraged

Lands in Proximity to Existing Development that are not within Environmentally Sensitive Areas. Such properties could be developed economically and with a minimum of adverse effects.

Existing Developable Property within the City Limits. In-filling of available property maximizes the cost effective use of existing utilities. Development in such areas will be encouraged. This objective needs to be balanced against the desire to have adequate vacant land for building site selection and housing choice.

In summary, growth will be controlled by the following categories:

<u>Prohibited</u>	<u>Controlled</u>	<u>Discouraged</u>	<u>Encouraged</u>
<ul style="list-style-type: none">- Wetlands- Floodway- Greenbelts- Hydric Soils- Steep Slopes (20% or Greater)	<ul style="list-style-type: none">- Shorelands- Adverse Soil Conditions- Zoning Uses- Flood Fringe- Slopes Between (12% and 20%)	<ul style="list-style-type: none">- Agricultural Preservation Areas- Construction Problems	<ul style="list-style-type: none">- Infilling Adjacent Suitable Areas

Prohibited and controlled areas are included in the ESA's. Proper application of methods used to encourage, control and prohibit development through policy action will directly satisfy the goals and objectives of this study.

Chapter 4 – Analysis and Evaluation

Population Analysis

Janesville's population growth rate has declined over the past 30 years. Between 1960 and 1970, the annual growth rate was approximately 3.2 percent. Natural increase (i.e., local births minus deaths) were responsible for most of this high population growth, although net immigration (i.e. people moving into Janesville) was also quite high. During the 1970's, population growth slowed to approximately 1 percent per year. By the 1980's, population grew only 0.2 percent per year.

The slow growth of the 1980's can be attributed to a nation-wide recession in the early 1980's that had a disproportionate effect on Janesville. The decline in employment opportunities at the local General Motors plant, which experienced large layoffs during the early 1980's, and at other Janesville firms led to a significant outmigration of residents seeking employment elsewhere. According to population estimates from the Wisconsin Department of Administration (DOA), Janesville actually lost population in 1983 and 1985. During the late 1980's, as Janesville's economy rebounded, population again began to increase at a modest rate.

In 1990, Janesville's population was 52,210. This represents a 48.4 percent increase from the 1960 population growth of 35,164, but only a 2.2 percent increase from the 1980 population of 51,071. While the City experienced slow population growth during the 1980's, the four surrounding townships in the planning area experienced a net decline in population of 205 people, 0.2 percent per year. This net decline can be attributed to three factors:

1. Aging of Township Population/Fewer Persons per Household

The townships experienced 449 more deaths than births over the decade. In addition, all of the townships decreased in the persons per household figure over the decade.

2. City of Janesville Annexations

City of Janesville annexations provide another explanation for this net decline in township population. Through annexations in the 1980's, the City drew 136 people from the townships.

3. Limited Residential Development

Little new subdivision activity occurred in any of the townships during the 1980's. The small population gains in Janesville and Harmony Townships were generally the result of the infilling of (pre-1980) subdivisions.

During the 1990's, the City of Janesville has experienced a significant increase in population. Department of Administration (DOA) population estimates and City of Janesville housing starts

indicate that the population has increased by about 7,400 people between 1990 and 1999, an increase of 14.2 percent.

The Department of Administration's January 1, 1999 population estimate for the City of Janesville was 59,626. This represents an increase of 7,416 people over the 1990 Census figure of 52,210, or a 1.77 percent annual increase in population over this period. Included in this population estimate is approximately 800 people from the Rock County Complex which was annexed to the City in 1995. The annual population increase without the Rock County Complex is 1.40 percent. Overall, 3,700 new housing units were added to the City's housing stock since 1990.

Land Use and Development

Residential Land Use

In 1990, 37.1 percent of Janesville's developed land was in residential use (4,271 acres), compared to 35.9 percent in 1980. The area in residential use increased by 628 acres, 17 percent over the decade. Meanwhile, the density of residential development decreased from 5.3 units per residential acre in 1980 to 5.0 units per acre in 1990. Lower densities within new subdivisions on the periphery of the city limits is a major cause for the decrease.

Commercial Land Use

In 1990, 6.7 percent of developed land was in commercial use (776 acres), compared to 6.4 percent in 1980. The area used commercially increased 114 acres, or 17 percent over the decade. The majority of this commercial growth occurred in the Milton Avenue/Highway 14 retail and service area on Janesville's northeast side.

Industrial Land Use

In 1990, 6.3 percent of developed land was in industrial use (729 acres), compared to only 4.9 percent in 1980. Land area used industrially increased 238 acres, 48 percent over the decade. This high growth in industrial land use was fueled by several public and private industrial development and marketing initiatives, including the establishment of two City industrial areas and two industrial TIF districts in the 1980's. Since 1990 the city has established 10 additional TIF districts to encourage and facilitate industrial growth and expansion.

In the past, projected manufacturing employment growth had been used as an indicator of future industrial development. However, in the 1980's, significant industrial development activity occurred despite a decrease of 1,996 manufacturing jobs (see City of Janesville 1993 Economic Analysis). Manufacturing employment growth was a poor indicator of additional industrial land use over this period because:

1. Newer industrial development occupied larger sites, resulting in lower employment densities. In 1980, the industrial employment density was 23.0 employees

per acres. In contrast, the density at the sites of 18 industrial firms new to or relocating within Janesville in the 1980's was 12.6 employees per acres.

2. The local General Motors and Parker Pen plants reduced employment by approximately 1,000 and 400 jobs respectively over the 1980's. In brief, both plants occupied the same land area in 1990, but employed fewer workers.

3. Janesville has had significant growth in wholesaling and other nonmanufacturing firms classified in the 1990 Land Use Survey as industrial uses. Thus, employment in wholesaling and some service industries occupying industrial land has increased in recent years.

Residential development, directed eastward since the 1960's approached Highway 14 on the far east side. Regional commercial development on Janesville's northeast side, established in the early 1970's, continued to expand in the 1980's with the development of Woodmans, Menards, Wal-Mart and other large facilities. Industrial development diverged the most from past trends by expanding significantly on the east side. The Kennedy Road Industrial Park, established by the City in 1980, was almost completely occupied by 1990. A new large-site industrial area containing approximately 280 acres was established northeast of the Wright Road/Highway 11 intersection in the late 1980s. Some new industrial areas have been established on the city's north side, off of Newville Road and Kennedy Road north of USH 14. New industrial sites have also been established on the city's south side off of Beloit Avenue.

Land Use Methodology

The Janesville Planning Department has prepared land use space requirement projections through the year 2020 for the City of Janesville. A description of the methodology used for these projections is provided in Appendix B, Table 18. By 2020, 24,393 acres, or 38.11 square miles of total city land area would be required to serve all projected land use space requirements. A discussion of the projected space needs for each of the major land use categories between 1990 and 2020 is provided in the following analysis.

Basis for Amendment to Sewer Service Area

The amount of land that can be included in sewer service area boundaries is limited by the need for urban land area to accommodate City growth within the 20 year planning period. Janesville's existing sewer service area was based on population and land area need projections from the early 1980s. The projections covered a 20 year period ending in the year 2000.

With the availability of 1990 U.S. Census data and a land use inventory completed in 1990, the City updated these 20 year projections through the year 2015. These updated projections were packaged in the City Planning Department's 1993 Base Study Update Series, endorsed by the City Plan Commission at a public hearing on February 28, 1994. By extending the final projection year out to 2020, these projections provide justification for the proposed expansion of Janesville's sewer service

area boundaries. While the previous set of projections anticipated the City's undeveloped land area needs between 1980 and 2000, the updated projections forecast land area needs between 1990 and 2020.

Population Projections

The City's *Population Analysis* describes trends and projects population for the City through 2020. The Planning Department used the "natural increase plus net migration" method to complete these projections. Under this method, projected birth, death, and migration rates are used to project total population. A summary of these projections is provided in Table 13. The 1990 Census population for Janesville was 52,210, while the January 1, 1999 Department of Administration population estimate was 59,626. The Planning Department projects that the City of Janesville population will grow to 67,935 in 2020. The *Population Analysis* did not include population projections for the four surrounding townships that complete the planning area.

In 1997, the Demographic Services Center of the Department of Administration (DOA) completed population projections for all cities, towns and villages in Rock County through 2020. Those projections were prepared by DOA at the request of the Rock County Planning and Development Agency. Table 13 displays DOA projections for the City of Janesville and the four surrounding townships. For the City, the projections are 4.0 percent higher than projections completed by the City Planning Department. For the four surrounding townships, DOA projects that population will increase from 9,374 in 1990 to 10,122 in 2020.

City population projections from the *Population Analysis* were combined with DOA projections for the townships to arrive at planning area population projections through 2020. Table 13 indicates that the population of the entire planning area is expected to increase from 61,584 in 1990 to 80,817 in 2020 - a 31 percent increase. The vast majority of this growth will occur within the City limits with public sanitary sewer and water service.

TABLE 13
POPULATION PROJECTIONS FOR PLANNING AREA
1990-2020

JURISDICTION	1990 CENSUS POPULATION	CITY/DOA POPULATION PROJECTIONS				
		2000	2005	2010	2015	2020
City of Janesville	52,210	60,295	62,962	64,788	66,278	67,935
-- City Projection (1)						
City of Janesville	52,210	60,581	63,293	66,005	68,460	70,695
-- DOA Projection (2)						
Four Surrounding Towns (2)	9,374	9,278	9,516	9,753	9,952	10,122
Rock	3,172	3,042	2,989	2,935	2,871	2,800
Janesville	3,121	2,876	3,045	3,214	3,370	3,514
Harmony	2,138	2,422	2,564	2,707	2,838	2,960
La Prairie	943	938	918	897	873	848
Total Planning Area (3)	61,584	69,859	72,809	75,758	78,412	80,817

SOURCES: (1) "Population Analysis," City of Janesville Planning Department, August 1993 (updated in 1997)
 (2) Department of Administration, Demographic Services Center, 1997.
 (3) Population projection for "Total Planning Area" uses Demographic Services Center
 Projections for the City of Janesville and the Towns.

Urban Land Use Space Requirement Projections

The City's *Land Use Analysis* projects the amount of additional undeveloped land area necessary to accommodate projected City development through 2015 (updated to 2020). The methodology for projecting the amount of land area required varied according to the land use type for which projections were made. For example, to project the land area necessary to accommodate anticipated residential development, projected housing unit growth in the City was multiplied by expected residential development density.

Table 14 summarizes land use space requirement projections through 2020. By 2020, 24,393 acres or 38.11 square miles of total land area would be required to serve all of Janesville's projected land use space requirements. This represents an increase of 10.84 square miles or 40 percent over the January 1, 1999 City land area of 27.27 square miles. This projection indicates that 10.84 square miles of undeveloped, developable land area outside the current City limits is required to meet Janesville's 20 year development needs. An established City policy is not to allow development to occur on septic systems in the City. Therefore, these 10.84 square miles of land should be allocated within the sewer service area boundaries but outside the City limits.

TABLE 14
LAND USE SPACE REQUIREMENT PROJECTIONS
1999 - 2020

LAND USE	1999 ACTUAL		2020 PROJECTED		INCREASE 1999-2020	
	ACRES	SQ. MI.	ACRES	SQ. MI.	ACRES	PERCENT
Developed Land	11,506	17.98	18,344	28.66	6,838	59.4 %
Residential	4,271	6.67	6,852	10.71	2,581	60.4 %
Commercial	766	1.20	1,260	1.97	494	64.5 %
Industrial	729	1.14	1,689	2.64	960	131.7 %
Extraction	286	0.45	286	0.45	0	0.0 %
Public/Quasi-Pub (2)	721	1.13	1,143	1.79	422	58.5 %
Transp./Comm./Util.	493	0.77	595	0.93	102	20.7 %
Streets/Rights-of-Way	2,687	4.20	4,100	6.41	1,413	52.6 %
Parks/Recreation	1,553	2.43	2,419	3.78	866	55.8 %
Undeveloped Land	3,929	6.14	6,049	9.45	2,120	54.0 %
Water	400	0.63	400	0.63	0	0.0 %
Agriculture/Vacant	3,529	5.51	5,649	8.83	2,120	60.1 %
TOTALS	15,435	24.12	24,393	38.11	8,958	58.0 %

SOURCE: "Land Use Analysis," City of Janesville Planning Department, July 1993

NOTES: (1) Land use projections are based on a 2020 population estimate of 70,695 for the City of Janesville, as projected by the Department of Administration.

(2) Public/Quasi-Public 2020 land use estimate includes 340 acres of Rock County Complex.

Chapter 5 – The Plan

Description of Proposed Map Update

This update is being completed to update the boundaries of Janesville's sewer service area to respond to the City's 20 year urban development needs between the years 1999 and 2020. The City is surrounded by four townships—Harmony, Janesville, La Prairie, and Rock. The 1994 amendment within the Town of Rock primarily satisfied the need for a map update within that Town. Therefore, this map update includes significant changes to the sewer service area boundary within Harmony, Janesville and La Prairie Townships.

Proposed *additions* to the City of Janesville sewer service area would affect the following Towns and sections:

- Township of Harmony; T3N, R13E; Sections 4, 5, 6, 7, 8, 9, 10, 15, 16, 34
- Township of Janesville; T3N, R12E; Sections 11, 12, 13, 21, 22, 27, 28, and 33
- Township of La Prairie; T2N, R13E; Sections 4, 5, 17
- Township of Rock; T2N, R12E; Section 3, 26

Proposed *deletions* from the City of Janesville sewer service area would affect a single parcel located in the City of Janesville (T3N, R12E), Section 13.

Table 15 describes the land area outside the City limits but within the existing sewer service area boundaries. Table 16 describes the land area outside the City limits but within the sewer service area boundaries *as proposed*. For analysis purposes, both tables divide the areas surrounding the city according to township: Janesville, Harmony, Rock and La Prairie Townships (as mapped in Figure 3). The proposed amendment would result in a net expansion of Janesville's sewer service area of 2,461 acres or 3.85 square miles (compare "TOTAL" line of both tables). Of this acreage to be added, 408 acres or 16% are presently developed, and 119 acres are undevelopable due to environmental constraints. As a result, this proposal would add 2,034 acres or 3.18 square miles of undeveloped, developable land to Janesville's sewer service area, and delete 0.16 square miles of land contained by the Janesville Sand and Gravel operation within the City. Therefore, the net addition of land to the sewer service area would be 3.02 square miles of land. The updated population and land area need projections which justify adding this amount of undeveloped land are provided in Chapter 4.

The proposed map update to Janesville's sewer service area includes alterations in several areas surrounding the City. These areas are labeled in Figure 11 entitled, "Proposed 20-year Sewer Service Area." A narrative description of each area proposed for inclusion or deletion from the Janesville Sewer Service Area is provided in the following section. In addition, this chapter incorporates a series of maps which illustrate the location of environmentally sensitive areas and slopes in excess of 12 percent that are contained within each individual sub-area.

Area 1: Austin Road West

This 140 acre proposed addition to the sewer service area is located in the Town of Janesville. It includes two non-contiguous land areas located between STH 11 on the south and CTH A on the north. The southern portion of this area (approximately 102 acres) is bounded by STH 11, Hayner Road, Mineral Point Road and a line that runs about ¼ mile west of Austin Road. The north section of Area 1 includes 38 acres of land situated along both sides of Austin Road south of STH 11. The area's undeveloped, developable lands are generally in crop production. Fisher Creek, including the floodplain, runs west to east through the south portion of Area 1. The area's topography is rolling, but drains to the southeast into the Fisher Creek Basin. In 1993, the City constructed a sanitary sewer in this basin to accommodate west side development. The predominant soil types in the area are Dresden, Durand, Kidder, Jasper, Juneau, Ohstemo, Otter, Pecatonica, Plano, Ringwood, Rockton, Rodman-Lorenzo, Rotamer, Sogn, St. Charles, Troxel, Warsaw, and Zurich. There is an environmentally sensitive area located along the Fisher Creek drainageway within this area.

Area 2: CTH A West and Reservoir Area

This 311 acre proposed addition to the sewer service area is located in Janesville Township. It includes two non-contiguous areas containing 249 acres in the north section and 62 acres in the south section. The north 249 acre addition is bounded on the west by the City of Janesville Arboretum, bounded on the north by the north section line of Section 22, bounded on the east by County Highway E and the city limits, and bounded on the south by the center line of Section 22. The south 62 acre addition is located south of the Arboretum and north of CTH A. It includes some side of the road development on the north side of County Highway A west of Austin Road. The area's undeveloped, developable lands are generally in crop production or wooded. The area's topography ranges from gently sloping soils in the south section to steep slopes existing along narrow drainageways on lands east of the Arboretum. The south 62 acres can be served by the Fisher Creek sewer interceptor constructed in 1993 to accommodate west side development. The north section of Area 1 drains toward Marsh Creek and will require a lift station to be served with sanitary sewer. Approximately 30% of the north 249 acre addition can be served through an extension of existing facilities within the Royal Oaks subdivision to the east. The predominant soil types in the area are Colwood, Dresden, Kidder, Oshtemo, Pecatonica, Rodman-Lorenzo, Rotamer, Sogn, St. Charles, Troxel, Westville and Whalan. This area includes some extensive land areas with slopes that exceed 12% west of CTH E.

Area 3: Highways 14 and F

This 83 acre proposed addition is located in Janesville Township west of USH 51 near the intersection of USH 14 and CTH F. The area is flat, but slopes toward the Rock River. Side of the road development along USH 14 occupies much of this area (approximately 60 acres of the 83 acres). This area can be served with gravity flow sewers through an extension of existing lines in Hemmingway Drive south of USH 14. The predominant soil types in the area are St.

Charles, Warsaw, Plano, and Dresden. There are no environmentally sensitive features within the area.

Area 4: Newville Road

This 82 acre proposed addition is located along the eastern edge of Janesville Township near the intersection of USH 14 and Newville Road. Area 4 extends north of USH 14 on the west side of Newville Road to the north section line of Section 12. The area's undeveloped, developable lands are in crop production. Developed lands include a portion of the County Highway Department facilities and light industrial uses along Newville Road. The area is generally flat south of Russell Road with areas of moderate slopes further to the north. As part of providing sanitary sewer service to Rest Area 17 in 1995, the City extended sanitary sewer up Kennedy Road which was sized to accommodate development in Area 4. Predominant soil types in the area include the Plano, Elburn, Troxel, Warsaw, St. Charles, Dresden and Kidder series. There are no environmentally sensitive features within this area.

Area 5: Newville-Kennedy Road

This 189 acre proposed addition is located in Harmony Township, in the north half of Section 7 and the south quarter of Section 6, bounded on the west by Newville Road, bounded on the east by the I-90 corridor, and bounded on the north side by the Timber Ridge rural subdivision. The area's undeveloped, developable lands are in crop production. The area is generally flat with the exception of the north one-third which contains isolated areas of slopes exceeding 20%. As part of providing sanitary sewer service to Rest Area 17 in 1995, the City extended sanitary sewer up Kennedy Road which was sized to accommodate development for most of Area 5. However, the far northwest portion of Area 5 will require a lift station to be served with sanitary sewer. Predominant soil types in the area are Plano, Elburn, Warsaw, St. Charles, Dresden and Kidder. Environmentally sensitive areas are found in locations containing slopes which exceed 20%.

Area 6: West Rotamer Road

This 148 acre proposed addition is located in Harmony Township along the west side of Rotamer Road, directly adjacent to the City limits on the south. The area is bounded on the west side by the Farmington Woods rural subdivision and on the north by the Grand View rural subdivision. A lift station will be required to serve the west one-third of this area, however, the east portion can be served with gravity flow sewers. Predominant soil types in the area are Kidder, Rotamer, and St. Charles. There are some environmentally sensitive areas associated with scattered slopes that exceed 12% and 20% within this area.

Area 7: Highway 26 – CTH Y Corridor

This 499 acre proposed addition is located on the far northeast side of Janesville in the STH 26 and CTH Y corridor in Harmony Township. The area's undeveloped, developable lands are generally in crop production. The developed land within Area 7 consists of side-of-the-road

residential and mixed use development along STH 26 and CTH Y. The area is flat to rolling and is characterized by an extensive ridge line that bisects the area north of STH 26. A sanitary sewer lift station has been located in the area to serve the southern portion of Area 7 up to the ridge line. A second lift station will need to be installed in order to serve lands located north of the ridge. Area 7 includes a rural corridor between Janesville and nearby Milton which has been subject to significant development pressure and a proposal for development of a regional park. Nearby sections of the city are developing rapidly with residential uses. The predominant soil types in this area are Kidder, St. Charles, Rotamer, Plano, Rodman, Troxel, Elburn, Warsaw, Casco, and two existing gravel pits. There are some environmentally sensitive areas associated with scattered areas of slopes that exceed 12% in this location.

Area 8: Harmony Town Hall Road

This 477 acre proposed addition is located between STH 26 and Town Hall Road in Harmony Township. The area's undeveloped, developable lands are primarily in crop production. The area is flat to rolling. It is generally bounded on the north by Bingham Road, on the east by a line extending 350 feet east and parallel to Town Hall Road, and on the south and west by the existing sewer service area surrounding the city limits. A sanitary sewer lift station has been located in the area to potentially serve lands adjoining STH 26. Lands further east may need to be served by an additional lift station. Areas located west of Town Hall Road can be served by gravity flow sewer from the south through an extension of lines. Area 8 is also part of a rural corridor between Janesville and nearby Milton which has been subject to significant development pressure. Nearby sections of the city are developing rapidly with residential uses. Much of the development in this area will be served by the future extension of the Wright Road sewer interceptor on the northeast side of the city. The predominant soil types in this area are Kidder, St. Charles, Rotamer, Plano, Rodman, Troxel, Elburn, Warsaw, Casco, and one existing gravel pit. There are some environmental features in the area associated with scattered areas of slopes that exceeding 12% and 20%.

Area 9: Ruger Avenue

This 53 acre proposed addition is located in Harmony Township along CTH MM (Ruger Avenue) east and adjoining USH 14. It is mostly flat land in crop production. This area can be served with gravity flow sewer lines which must be extended north of Ruger Avenue and to the east along Blackhawk Creek. Predominant soil types in the area are the Plano series. There are no environmentally sensitive areas within this area.

Area 10: USH 14 – STH 11 Intersection

This 249 acre proposed addition is located in La Prairie Township on the south side of STH 11 and west of USH 14. Area 10 is directly adjacent to the city limits. It is mostly flat land in crop production. Currently, only the northeast portion of this area can be served with gravity flow sewer. The remainder of the land area to the south and west will require a lift station or the

extension of sewer lines along Delavan Drive. Predominant soil types in the area are Plano and Warsaw. There are no environmentally sensitive areas in this update area.

Area 11: Read Road

This 184 acre proposed addition is located between I-90 and Read Road south of Delavan Drive and the Wisconsin and Southern Railroad in La Prairie Township. The area is generally flat and in crop production. It is bounded on the north by a ridge line which contains slopes in excess of 20%. An extension of the Read Road sewer interceptor south of Delavan Drive is necessary to serve this area. Approximately 37 acres of land within this area are developed with rural residential land uses. Predominant soil types in the area are Plano, Jasper and Oshtemo.

Area 12: USH 351 – Interstate 90 Intersection

This 66 acre proposed addition is located southwest of the intersection of STH 351 (Avalon Road) and I-90. It is mostly flat land in crop production. No environmentally sensitive areas exist in this update area. An extension of the Avalon Road sanitary sewer trunk will be required to serve this area. Predominant soil types in the area include the Warsaw series.

Area 13: Hanover Road

This 33 acre proposed addition is located in Rock Township on the north side of Janesville-Hanover Road just west of the County Highway D. It is mostly flat land in crop production. This area can be served by the Fisher Creek sewer interceptor, constructed in 1993 to accommodate west side development. Predominant soil types in the area are Edmund, Griswold, Oshtemo, Ringwood, Warsaw, Whalan, Winnebago, and Zurich. No environmentally sensitive areas are mapped within this area.

Area 14: Janesville Sand and Gravel (deletion)

This 100 acre proposed deletion is located on the north side of Janesville, just south of the Rock County Complex. This area will be mined as part of the Janesville Sand and Gravel operation and will otherwise be undevelopable. Therefore it is advisable to remove this area from the sewer service area. This would allow approximately 100 acres of area to be redelineated more appropriately in the service area boundary.

Area 15: Rock County Agriculture Complex

This 25 acre proposed addition is located on the north side of Janesville, immediately south of and adjoining USH 14. This area includes the east 25 acres of the Rock County Complex. It is mostly flat and in crop production. Development within this area can be served by gravity flow sewer lines located to the south of the area. The predominant soil type in the area includes the Plano series. There are no environmentally sensitive areas in this location.

Area 16: Rock County Airport

This 22 acre proposed addition is located in Rock Township on property contained by the Rock County Airport. The boundaries of the existing sewer service area would be extended south of the airport runways to include 22 acres of land necessary to accommodate proposed golf course-related development within this area. Public sewer and water are required for clubhouse and maintenance building improvements at the planned facility. The area is flat to rolling with a limited area of 12% slopes. The predominant soil types in the area include the Warsaw and Oshtemo series. This area can be served through connections to a sanitary sewer interceptor which was constructed in 1994 to serve the airport property.

Summary of Land Use Changes in Janesville Area Sewer Service Area Plan:

Table 17 includes a summary of the proposed land use changes to Janesville's Sewer Service Area Plan. Adjustments within each of the four surrounding Townships are also shown on Table 17. A summary of total land use changes is provided below:

- City of Janesville Land Use Requirement for 2020	38.11 Square Miles
- Total City Land Area (as of January 1, 1999)	27.27 Square Miles
- Additional Land Area Requirement	10.84 Square Miles
- Undeveloped Land Area Currently Available Within Sewer Service Area Outside City	6.08 Square Miles
- Undeveloped Land Area City May Add To 2020 Sewer Service Area	4.76 Square Miles
- Existing Delineated Sewer Service Area Boundary	36.09 Square Miles
- Area of Existing Development/Envir. Corridors Outside City Limits within Existing Sewer Service Boundary	2.74 Square Miles

The following areas are proposed for addition and/or deletion to the existing sewer service area boundary. Total square miles of land added or deleted reflect undeveloped land areas only.

Janesville Township

- 1) Area West of Austin Road
 Additional 0.16 Square Miles
- 2) Area of Buehl Farm
 Additional 0.32 Square Miles
- 3) Area North of USH 14 at CTH F intersection
 Additional 0.03 Square Miles
- 4) Area West of Newville Road
 Additional 0.03 Square Miles
- 15) Area of Rock County Farm
 Additional 0.04 Square Miles

Harmony Township

- 5) Area Between Kennedy Road and Newville Road
 Additional 0.29 Square Miles
- 6) Area along West Rotamer Road
 Additional 0.20 Square Miles
- 7) Area Between USH 26 and CTH Y and Area along Townhall Road
 Additional 0.73 Square Miles
- 8) Area along Townhall Road
 Additional 0.55 Square Miles

- 9) Area along Ruger Avenue
Additional 0.06 Square Miles

La Prairie Township

- 10) Area at USH 14 STH 11 Intersection
Additional 0.37 Square Miles
- 11) Area east of Read Road
Additional 0.23 Square Miles
- 12) Area south of STH 351
Additional 0.09 Square Miles

Rock Township

- 13) Area North of Hanover Road
Additional 0.05 Square Miles
- 16) Area at Rock County Airport
Additional 0.03 Square Miles

Janesville Township

- 14) Area of Janesville Sand and Gravel
Delete 0.16 Square Miles

Additional Square Miles	3.18
Deleted Square Miles	<u>0.16</u>
Total of Changes	3.02 Square Miles (rounded estimate)

An additional 3.02 square miles (1,934 acres) would be added to the existing sewer service area. This would bring the total area for the new sewer service area to 39.94 square miles, of which 3.56 square miles are considered to be undevelopable area (existing unsewered development or environmentally sensitive areas). Subtracting undevelopable area (3.56 sq. mi.) from the total sewer service area (39.94 sq. mi.) would leave 36.38 sq. mi. of developable land. Therefore, an additional 1.73 square miles would be available for future amendments to satisfy the City of Janesville's land area need projection of 38.11 square miles for the year 2020.

This reserve currently would be:

$$\frac{1.73}{36.38 - 27.27} = 19\%$$

This would allow flexibility for the City of Janesville to request amendments to the sewer service area in the near future if development trends indicate additional land is required. An amendment for an area that is less than the 1.73 reserved square miles (1,107 acres) would be considered to be in accordance with the goals of this plan.

**SUMMARY OF CHANGES TO SEWER SERVICE AREA,
BASED ON 20 YEAR LAND USE NEED FOR THE CITY OF JANESVILLE**

	A	B	C	D	E	F	G
	Current City Limits Area (Jan. 1, 1999)	Current Sewer Service Area	Projected City Land Use Need For 2020	Additional Land Use Required For 2020	Gross Available Land	Environmentally Sensitive Areas within Existing Sewer Service Area Boundary	Existing Unsewered Development within Current Sewer Service Area Boundary
	Sq. Miles	Sq. Miles	Sq. Miles	Sq. Miles	Sq. Miles	Sq. Miles	Sq. Miles
City of Janesville	27.27	36.09	38.11	10.84	8.82	0.35	2.39

	H	I	J	K	L	M	N
	Undevelopable Areas Within Existing Sewer Service Area Boundary	Net Land Available within Existing Sewer Service Area Boundary	Additional Land Required for Sewer Service Area Boundary	Gross Area Required for 2020 Sewer Service Area	Plan Additions (Excludes Env. Sensitive Areas or Existing Development Totalling 0.83 sq.mi.)	Plan Deletions	Delineated Sewer Service Area Boundary
	Sq. Miles	Sq. Miles	Sq. Miles	Sq. Miles	Sq. Miles	Sq. Miles	Sq. Miles
City of Janesville	2.74	6.08	4.76	40.85	3.18	0.16	39.94

Policies for Implementation of the Plan

The goals and objectives presented in Chapter 2 of this document represent a refinement of local planning principles intended to provide for economical and compatible future development of the City. Based on the anticipated needs of the area, specific policies can be implemented to help achieve the goals and objectives of the Plan. Policies for each targeted goal and objective of the Janesville Sewer Area Service Plan are listed below.

GOAL I. To provide and maintain public utilities and services which efficiently meet the needs of all segments of the community while protecting water resources and the quality of the environment.

OBJECTIVE 1. By making maximum use of the existing facilities.

POLICIES:

- 1) Streets, sewer lines and water lines should be designed so that a minimum of energy is utilized in their use.
- 2) Land uses should be planned to minimize travel and energy use. New development should be designed to accommodate alternative energy sources.

OBJECTIVE 2. By developing efficient water, sewer, flood control, and solid waste facilities in such a way as to protect the quality of the environment, particularly surface and groundwater resources.

- POLICIES:
- 1) Environmentally sensitive open space and unique natural areas should be preserved and not used for urban development.
 - 2) Proposed developments should include areas which set aside open space for recreation, storm water retention, and natural drainage ways for storm water run-off.
 - 3) Reduce peak stormwater flows by increasing infiltration of stormwater runoff throughout watersheds.
 - 4) Work towards implementing some of the more specific recommendations made in the "Lower Rock River Basin Water Quality Management Plan".
 - 5) Local units of government should work together to begin comprehensive stormwater management planning to identify stormwater management needs in the planning area. Stormwater control ordinances that address both water quality and quantity should be adopted by civil divisions that, while not involved in a priority watershed program, still need comprehensive stormwater management.

OBJECTIVE 3. By eliminating conditions created by inadequate sewage collection and treatment facilities which result in potential threats to the health and welfare of the public.

- POLICIES:
- 1) Investigate alternative methods that can be used to oversee the installation, maintenance, and cleaning of on-site sewage systems.
 - 2) Rock County should participate in the Wisconsin Fund program for replacement of failing on-site systems.
 - 3) Eliminate inadequate on-site sewage systems within the urban service area through cost-effective systems which can be adapted to the conventional city collection system, as urban services are extended into these areas.

OBJECTIVE 4. By encouraging future development to locate in areas suitable for development where environmental impacts can be sufficiently mitigated.

- POLICIES:
- 1) Adopt and enforce a construction site erosion control ordinance for land disturbing activities not covered under the Uniform Dwelling Cost for 1 and 2 family dwellings and commercial areas, such as locally funded road and bridge construction (or areas not covered by NR 216 rules for the development of industrial pollution prevention plans).
 - 2) Apply to the Urban River Grant Program, Streambank Acquisition Program, the Lakes Planning, or Protection Grant Program, or other grant funding sources when acquiring land along waterways and implementing plans for development along waterways.
 - 3) Review and revise existing floodplain zone maps to accommodate potential hydrologic modifications.

OBJECTIVE 5. By controlling development of areas where environmental problems indicate the development should not take place, especially; shorelands, wetlands, areas with high water tables, steep slopes, areas with soil limitations, and areas with unique natural features.

- POLICIES:
- 1) Sanitary sewer extensions to serve development in these areas will be given a low priority unless such extensions are an integral part of long-range plans for the area.
 - 2) Development of lands with slopes greater than 20% should be prohibited. Areas with slopes ranging between 12% and 20% should be developed in accord with standards that address erosion control, minimum lot size/building area requirements, vegetation removal, and site specific grading plans. Implementation of those specific development standards should be accomplished through amendments to City, County and Township Land Division Ordinances.
 - 3) Subdivision plat designs which do not provide adequate means of protecting future residents from problems associated with drainage and steep slopes will be rejected. In addition, developers will be required to submit detailed plans for adequately draining such areas.
 - 4) Certain floodplain, wetland, and unique natural or wildlife areas will be zoned for recreation or conservation uses.
 - 5) Sewer extensions will not be approved for development of "Prohibited Areas" as identified in Chapter IV, however they will be allowed to be placed in greenbelts and certain other ESA's to facilitate development adjacent to these areas.

GOAL II. To guide the future development of the City of Janesville within the defined urban service limits in an efficient, sequential, orderly, and compatible manner.

OBJECTIVE 1. By extending urban services to those areas where demand exists within the urban service limits only.

- POLICIES:
- 1) Extensions will not be made beyond the 20 year urban service area unless the plan is amended.
 - 2) Sewers may not be extended beyond the urban service area, however, they should be sized to accommodate future basin development that may occur outside of the service area in the future. It should be noted that interceptor sizing is not a factor in the local review process. Interceptor sizing is based on natural resource code specifications.
 - 3) Public utilities and services will be extended to development areas on a cost effective basis.
 - 4) Development in the Urban Service Area is limited to areas that have adequate public utilities and services or that have adequate services and are physically designed to accommodate higher density development when public utilities become available.
 - 5) Reserve at least 10% of the proposed land use allocation for the City by delineating only 90% of the required sewer service area. In this way, future amendments to the plan can be justified without the need for comprehensive plan updates every time that a request for amendment to the service area is requested.

OBJECTIVE 2. By encouraging a land use pattern which will reduce the length of trips.

- POLICIES:
- 1) Where compatible with community plans and other community policies, sanitary sewer extensions into areas in proximity to existing development will be given high priority. Extensions which may cause leap-frog or sprawl development will be discouraged.
 - 2) Encourage increased density of development through local land use regulations.
 - 3) Provide sufficient land area for higher density development through zoning.
 - 4) Formulate sewerage assessment policies that will encourage compact development and discourage scattered development.

- 5) Base the fees for collection and treatment upon the costs to provide these services.

OBJECTIVE 3. By providing sufficient land area in which the future development of the City can be accommodated.

POLICIES: 1) Areas adjacent to the City limits which are contiguous to urban development and are experiencing development pressures should be provided with a full range of urban services.

OBJECTIVE 4. By encouraging utilization of vacant land within the City that is already provided with urban services.

POLICIES: 1) Direct in-fill development and re-development of areas that do not require upgrading existing public facilities.

GOAL III. To encourage future development, that is outside the urban service limits, to locate in rural transition areas in an efficient, orderly, and compatible manner.

OBJECTIVE 1. By encouraging development that is consistent with city, town, and county plans.

POLICIES: 1) Planning should be done on an area-wide basis by the representatives of the local governing units.

2) Efforts should be made to emphasize the benefits from new development to the entire urban area and not only to each separate governmental entity. Increase intergovernmental cooperation.

3) Review of proposed development of area-wide significance should have input from all involved units in the urban area.

4) Sewer service extensions will be used as a tool to implement community plans by directing growth into the most desirable areas.

5) Coordinate planning efforts with the four towns in the Janesville planning area and Rock County to develop future land uses, future road corridors, and general subdivision policies for the urban transition area to ensure a continuous road network and consistent residential, commercial and open space standards.

OBJECTIVE 2. By encouraging future rural developments to locate in those areas that are suitable for on-site sewage disposal systems.

- POLICIES:
- 1) Rural transition areas are limited to locations adjacent to existing developed areas where adequate public facilities and services are available and soils are suitable for on-site disposal systems.
 - 2) Zoning densities for residential development will be based on the soil capabilities for on-site sewage disposals.
- OBJECTIVE 3. By encouraging industrial developments to locate on sites having necessary public services.
- POLICIES:
- 1) New industrial developments should be contiguous with existing development.
 - 2) The location of new industry should follow land use plans so that public utilities such as sewers and streets can be properly sized when constructed to provide adequate service.
 - 3) New industrial development sites within the urban service area should not be created unless the development on those sites is served with public sewer and water facilities.
- OBJECTIVE 4. By encouraging the utilization of existing commercial districts as the primary trade area before providing additional commercial areas.
- POLICIES:
- 1) Zone adequate areas for commercial purposes in a variety of locations.
 - 2) Limit commercial development to those areas indicated on the City Comprehensive Plan and County plans.
 - 3) Discourage the scattering of commercial uses and strip-type commercial development along streets and highways through local zoning ordinances.
 - 4) Rezoning of areas to commercial districts should be discouraged without an identified need.
 - 5) New commercial development sites within the urban service area should not be created unless the development on those sites is served with public sewer and water facilities.
- OBJECTIVE 5. By working with the four towns in the Janesville Planning Area and Rock County to develop and adopt local development plans that are mutually consistent and compatible.

- POLICIES:
- 1) Planning by municipalities should avoid duplication of public facilities and services.
 - 2) Planning at all levels should consider drainage basin boundaries in addition to political boundaries.
 - 3) Establish a system for review of the installation of public sewerage systems within the County. The Janesville portion of this system is established by this plan.
 - 4) Cooperate with the Department of Natural Resources in identifying appropriate techniques for each wastewater treatment need.

GOAL IV. To promote the conservation of agricultural land.

OBJECTIVE 1. By encouraging the orderly and sequential extension of urban services, with the intent of preventing the premature development of agricultural land.

POLICIES: 1) Agricultural Preservation Areas should not be used for urban development if other more suitable areas are available.

OBJECTIVE 2. By adopting the goals and objectives of the 1979 Rock County Farmland Preservation Plan.

- POLICIES:
- 1) Development of farmland preservation areas should be limited in agricultural areas to agricultural production, agricultural services, and residential usage for the immediate family of the farmland owner or those actually involved with agricultural activities on the respective farm.
 - 2) Farmland preservation areas will contain a minimum of 100 acres of contiguous agricultural land.
 - 3) Transition areas will contain a minimum of 35 acres of contiguous land.
 - 4) Recreational facilities should be encouraged to locate in those portions of Environmentally Sensitive Areas that are not farmland preservation areas, are compatible to the already existing land use and readily accessible to existing and future development areas.
 - 5) Public and quasi-public facilities should be located in existing development and transition areas, and only allowed in agricultural areas after a complete and thorough review by the local reviewing agency

concludes that the proposed site would be of greater benefit to the community as a proposed use, rather than its agricultural use.

OBJECTIVE 3. By encouraging higher density development.

- POLICIES:
- 1) Recognize the need for both a concentration of improvements and the preservation of open space in the design of neighborhoods.
 - 2) Encourage the development of vacant property in which the city has already invested public funds for public utilities.

OBJECTIVE 4. By minimizing problems associated with large lot rural subdivisions locating in the urban service limits.

- POLICIES:
- 1) Rural residential development within the urban service area should be planned to accommodate future urban densities and urban services.
 - 2) Surveys and subdivision plats creating new residential development sites within the urban service limits should be discouraged unless arrangements are made to provide urban services including sanitary sewer and water.

OBJECTIVE 5. By encouraging future rural subdivisions to locate within the rural transition areas as defined in the Rock County Farmland Preservation Plan.

- POLICIES:
- 1) Sanitary sewer extensions into Agricultural Preservation Areas will be coordinated with local farmland preservation planning.

OBJECTIVE 6. By encouraging development to locate outside farmland preservation areas.

- POLICIES:
- 1) See policies under Goal IV, Objective 2.

Chapter 6 - Implementation

Implementation Process

With the adoption of this plan, the DNR will require a map of the Janesville Urban Service Area. Proposed sewer extensions will be reviewed against this map to determine if the extensions are in conformance with the current service area boundary. The Metropolitan Planning Organization (MPO) will be responsible for advising the DNR on whether the proposed sewer extensions are within the Urban Service Area. In addition, the DNR may request the MPO's advice on proposals to establish package treatment plants within the planning area. Finally, the MPO will review proposed amendments to the urban service area boundary and make recommendations to the department on such proposals.

The MPO was organized to provide coordination and area-wide planning for the Janesville Area. It is made up of local officials from all local governmental units in the urban area. The MPO Policy Board is made up of representatives of the City of Janesville, the townships of Janesville, Harmony, Rock, La Prairie and Rock County. The individuals and groups to be involved in these processes are as follows:

- The County Planning Director will act as the Administrative Agent of the MPO Policy Board.
- A Technical Committee including the following members:

City of Janesville

Director of Planning
Director of Public Services
& City Engineering
Utilities Director
Public Works Director

Rock County

Director of Planning
Environmental Health Director
County Engineer
Chairman of County Planning &
Zoning Committee

Townships

Janesville Board member or designee
Harmony Board member or designee
LaPrairie Board member or designee
Rock Board member or designee

- Rock County Planning and Development Committee
- The MPO Policy Board including the following members:

Janesville City Council
 Rock County Board Representative
 Town Chairpersons for Janesville, Harmony, LaPrairie and Rock Townships, or
 their designee

The City Planning Director will be the Secretary of both the MPO Policy Board and the Technical Committee. This will provide a common link between the two committees.

Approval Process

1. The County Planning and Development Agency prepares plan updates and amendments with the assistance of the city planning and engineering staff.
2. Draft updates or amendments are reviewed by the Technical Committee, Rock County Planning and Development Committee and MPO Policy Board for recommendation to the DNR.
3. All plan updates and amendments will be forwarded to the Rock County Planning and Development Committee following the Technical Committee's review and recommendation. The Janesville Planning Director then forwards the Technical Committee and the County Planning and Development Committee recommendations to the MPO Policy Board. The MPO Policy Board reviews the proposal for consistency with the sewer service area plan policy and makes the final recommendation to forward the plan to the DNR. The MPO Policy Board and County Planning and Development Committee meetings shall be properly noticed and conducted as public informational hearings.
4. The Department of Natural Resources reviews the plan based on consistency with applicable state statutes and administrative code for their approval.
5. Rock County Planning and Development Agency staff incorporate plan changes in the Rock County Water Quality Management Plan and the Rock County Comprehensive Development Plan. Other local agencies are asked to incorporate changes to the Janesville sewer service area on their local development plans.

Responsibilities of the Administrative Agent (County Planning Director)

1. Call meetings of the Technical Committee in consultation with Committee Secretary as necessary.
2. Prepare 208 Plans and documents in accord with applicable regulations. Plans shall be prepared following consultation with the Secretary. The Administrative Agent shall forward said plans and documents to the Technical Committee, County Planning and Development Committee and MPO Policy Board. The Administrative Agent with the assistance of the

Secretary shall review plan updates and amendments with the County Planning and Development Committee.

3. Coordinate review of sewer extension by County personnel for conformance with the sewer service area as delineated within the Water Quality Management Plan.
4. Provide written notification of conformance or non-conformance of sewer extensions submitted for approval within fifteen (15) working days of receiving the written request for approval. Plans should be approved if the request for sewer extension is within the sewer service area and the plans conform with the goals and policies of the Water Quality Management Plan. Notification should indicate that the acceptance letter should be forwarded to the DNR as part of their submittal.
5. Present technical information to the Technical Committee, MPO Policy Board and County Planning and Development Committee regarding sewer extension requests, plan amendments, and package treatment proposals within the planning area.

Responsibilities of the Secretary (City Planning Director)

1. The Secretary shall serve in an advisory capacity to both the Technical Committee and MPO Policy Board.
2. Facilitate the 208 planning process by maintaining a close working relationship with the Administrative Agent and his/her staff in plan preparation. Since the County utilizes technical information, or “base data,” from the City of Janesville as a primary component of the Sewer Service Plan, review and comment on such information by the Secretary during plan preparation is necessary to ensure that technical data is accurately incorporated into the plan.

Responsibilities of the Technical Committee

1. Review proposed sewer extension requests which involve interpretation of the sewer service area boundary, and make recommendations to the County Planning and Development Committee and MPO Policy Board.
2. Review and make recommendations to the County Planning and Development Committee and the MPO Policy Board on proposed amendments to the Plan (sewer service area boundaries).
3. Review and prepare recommendations to the County Planning and Development Committee and MPO Policy Board concerning package treatment plant proposals within the planning area.

The City of Janesville will act as the designated management agency for all wastewater treatment and collection needs for their system.

Procedures for Sewer Extensions

The local review process is described below:

1. The municipality or their consulting engineers should submit a letter and a simple plan map of the proposed sewer extension and approximate 20-year service area (or larger in specific cases if justified on a cost effective basis) with a copy of DNR Form 3400-105 "Sanitary Sewer Extension Submittal" for the proposed extension, to the Rock County Planning and Development (RCP&D) Office. To avoid delays, this submittal shall be made early in the planning process, prior to completing detailed plans and specifications for the project. Submitting the plan early will insure that local review is made prior to submittal of the plans to the DNR and that costly detailed sewer design and specifications documents are not prepared for areas that do not conform to the plan service area and are subsequently rejected by the DNR.
2. RCP&D will review all submissions and will notify the applicant of the findings in writing within 15 working days of receipt of the plan map. If the proposed sewer extension is in conformance with the plan, the Administrative Agent's notification should be attached to the sewer extension plans which are submitted to the DNR by the applicant.
3. If the proposed extension is not within the sewer service area, the RCP&D shall so notify the applicant. If the applicant wishes to appeal the boundary determination of the RCP&D, or if the RCP&D concludes that there is an interpretative question concerning the service area boundary, the request will be reviewed by the Technical Committee and a recommendation will be presented to the Policy Board. If the Policy Board judges that the request is within the sewer service area, the municipality will be notified.
4. If the proposed extension is determined to be outside of the sewer service area or incompatible with the current water quality plan, the municipality will be informed. If the municipality wishes to pursue the extension, the municipality should request a plan amendment. The amendment process is discussed in the following section. In almost all cases a sewer service area boundary amendment will be required to make the extension conform to the plan. The applicant may also appeal a boundary ruling to the department.
5. If the plan is amended, the community should submit the proposed sewer extension plan as discussed in #1 above.

Criteria and Procedures for Amending the Plan

Requests for amendment of the adopted sewer service area and plan map could involve undeveloped or already developed land and could be initiated by one of several sources: property owners, the City of Janesville, another government agency, or the MPO Policy Committee. Three types of amendments are possible. The first kind involves no change in the total service area. For every acre added, an acre is deleted. The second type includes the use of the reserve area or unallocated land. And the third kind of amendment involves an increase in the total service area. This amendment would be approved by the department only if it is justified by

unanticipated growth or density of development that is different than what is estimated in this document.

Criteria for review of a proposed plan amendment includes the following information:

- a) Sewer service can be provided in a cost effective manner.
- b) The receiving, collection and treatment facility can adequately transport and treat the waste water from the area and the amount of undeveloped land in the proposed area.
- c) The amendment is consistent with the policies and goals of this plan.
- d) The amendment conforms with local and county plans and zoning.
- e) There will be no significant adverse water quality and/or environmental impact associated with providing sewer service to the area.
- f) The proposed amendment to the service area does not exceed the total projected sewer service area acreage requirement as defined in the plan. An amendment adding vacant land to the sewer service area requires excluding from the sewer service area a parcel of similar size to the one being added or use of a portion of the reserve area. If developed land is proposed for inclusions in the sewer service area, this criteria does not apply.

The procedure for amending the plan should be similar for all of the above cases. If the request is initiated by a property owner, Step 1 below will be necessary. If the request is initiated by the policy board, the process will begin with a review and recommendation by the technical committee, Step 2. The steps required for plan amendment are outlined as follows:

1. The property owner(s) may apply to the appropriate agency expected to provide wastewater service to request the plan amendment area and the applicant shall provide information showing that the proposal is consistent with the criteria above.
2. If the property owner's request is reviewed and approved by the municipality with jurisdiction, the application would be forwarded to the Janesville Technical Committee. The application should be accompanied by a map of the proposed area to be serviced, existing and anticipated population and wastewater generation of the area and a description of the type of development that is expected to occur. The Technical Committee shall evaluate the application against the criteria and other relevant factors and make a recommendation to the County Planning and Development Committee and MPO Policy Board.
3. The Rock County Planning and Development Committee shall hold a public hearing and review the request on the basis of the stated criteria and any other relevant factors, and then forward its recommendation to the MPO Policy Board. If the County Planning and Development Committee does not make a recommendation within 30 days of their receipt of the request, the MPO Policy Board may proceed to consider the request without their recommendation.
4. The Janesville MPO Policy Board shall evaluate the recommendation of the Technical Committee and County Planning and Development Committee, if received, and then, following

a public hearing, forward its recommendation to the Wisconsin Department of Natural Resources.

5. If approved by the Department of Natural Resources, the requested amendment will be adopted and become part of the existing plan. The department will notify the MPO Policy Board and the Administrative Agent of its action.

Plan Updates

A comprehensive review and update of the sewer service plan should be completed every five years. However, the plan should be updated whenever there is an obvious change in community needs. Updates to the plan are intended to address the following components:

1. A revision of the population and demographic projections for the next 20-year planning period shall be reviewed by the Department of Administration (DOA) per NR 121.
2. A review of housing starts, population densities, household size changes, and urban development trends within the planning area.
3. An assessment of the impact of major land use changes in the planning area.
4. An examination of the significant environmental changes.
5. A review and revision of the goals and objectives of the plan, based on present concepts and needs.
6. A discussion of any social or economic impacts on the area that may affect the area-wide water quality planning efforts.
7. A list and explanation of any interim amendments to the plan that occurred since the last update to the plan.
8. A revised service area boundary based on 20-year projections.
9. A review of any affective changes in the constitutional or implementation structure of the plan.
10. An update of citizen participation efforts.

The plan update will be controlled and directed by using the approval committee and review process outlined in this Plan.

REFERENCES

City of Janesville; City of Janesville Land Use Analysis; Janesville, WI, July, 1993.

City of Janesville; City of Janesville Population Forecasts; Janesville, WI, July, 1993.

City of Janesville; City of Janesville Housing Analysis; Janesville, WI, July 1993.

Rock County Planning Office; Janesville Area Point Source Water Quality Management Plan; Janesville, WI, December, 1983

Rock County Planning and Development Agency; 1990 Land Use Study for Rock County, Wisconsin; Janesville, WI, 1991.

Rock County Planning and Development Agency; 1980 Land Use Study for Rock County, Wisconsin; Janesville, WI, 1981.

Dane County Regional Planning Commission; Environmental Corridors; Madison, WI, December 1984.

Wisconsin Department of Natural Resources; Public Draft of the Lower Rock River Basin Water Quality Management Plan, Madison, WI, 1998.

United States Department of Agriculture, Soil Conservation Service; Soil Survey of Rock County, 1974.

Brown County Planning Commission; 1995 Brown County Sewage Plan, Green Bay, WI, 1996.

Wisconsin Administrative Code, NR 121, August 1981, No. 308, Areawide Water Quality Management Plans.

APPENDIX A

Projected Sewage Flow/Loadings and Plant Capacity

An analysis was conducted to estimate the impact of proposed development from amendment areas to Janesville's sanitary sewer system and Wastewater Treatment Plant (WWTP).

Sewage Flow and Organic Loading

Table 18 estimates sewage flow and loadings that would be generated by the planned development in areas proposed for inclusion within the sewer service area and areas between the existing city limits and sewer service boundary. Projected flow was estimated for each of the sub-areas based on developable acreage planned for each sub-area and the ratio of proposed acreage to existing acreage for each land use type. Projected uses in the proposed amendment area would generate an estimated flow of 2,500,000 gallons per day. This flow would consume 14 percent of the capacity of the WWTP and bring the plant to 95 percent of its total capacity.

Table 18 also estimates the projected loadings of biochemical oxygen demand (BOD), total suspended solids (TSS), and total Kjeldahl nitrogen (TKN) from the projected amendment areas. The projected BOD, TSS, and TKN loadings would consume 15%, 15% and 9%, respectively of the WWTP's design capacity to process each of these loadings.

WWTP: Existing Conditions and Design Capacity

The present City of Janesville municipal WWTP was constructed in 1970 along the western edge of the Rock River in the southwest corner of the City. The original design capacity for flow was 16 million gallons per day. In December 1983, Strand and Associates Completed a Wastewater Treatment Facilities Plan which recommended that the WWTP be upgraded to increase flow and loadings capacity and treatment. As a result, the City in 1991 upgraded the WWTP to a flow capacity of 17.75 million gallons. The WWTP's capacity to process loadings also was expanded (see Table 12). Strand estimated the upgraded WWTP would have sufficient design capacity to accommodate City growth through 2006. This estimate was based on optimistic population projections for Janesville (70,000 persons by 2006).

In November 1996, Rust E&I completed the *Janesville WWTP Loading and Capacity Study*. The purpose of the study was to review operating data of the Janesville WWTP to compute reserve flow and loadings capacity (see attached study results). This study indicates that WWTP was operating at 71 percent flow capacity in 1995. The anaerobic digestion process, which is most affected by TSS loadings, was the most limiting process at 82 percent capacity. Therefore, Rust concluded the plant was operating at 82 percent capacity in 1995. Rust concluded, because City of Janesville population projections had been lowered to about 60,000 persons by 2006, the WWTP should have reserve capacity in 2006 for flow and BOD, TSS, and TKN loadings.

Projected Flow/Loadings vs. WWTP Design Capacity

Table 19 compares the projected flow, influent loading, and organic loadings generated by development in the proposed amendment areas and area between the present City limits and service area boundary with the capacity of the WWTP to accommodate that amount of flow and loadings. To accomplish this, projected flow/loadings were added to the sum of the City's existing 1995 flow/loadings and those projected with the development of the amendment areas and area between the City limits and present service area boundary. These totals were compared to the design capacity of the WWTP. The final column of Table 19 indicates the combined sewage flow would be at 95 percent of design capacity. The anaerobic digestion process at the WWTP would be the first factor requiring an upgrade of the WWTP. Based on projections and current plant loadings, the plant would require an upgrade in the year 2011. When a study similar to that completed by Rust E&I in 1995 warrants, the City of Janesville would reevaluate when to upgrade the WWTP. However, within the next 10 years, the WWTP should have sufficient capacity to accommodate projected flow and loadings.

APPENDIX B

LAND USE SPACE REQUIREMENTS AND METHODOLOGY

Residential

Estimated Dwelling Requirements for the year 2020 in the City of Janesville

70,695	Population in 2020 (DOA prepared estimate)
69,232	Population in Households
<u>2.30</u>	<u>Estimated persons per household in 2020</u>
30,101	Housing Units Required in 2020 (Occupied Units)
30,101	Housing Units Required in 2020 (Occupied Units)
<u>4.2%</u>	<u>Vacancy Rate</u>
1,255	Total Housing Units Required in 2020
31,355	Total Housing Units Required in 2020
<u>21,186</u>	<u>Existing Housing Units in 1990</u>
10,169	New Housing Units Required 1990-2020
10,169	New Housing Units Required 1990-2020
<u>3.94</u>	<u>Housing Units per Acre</u>
2,581	Acres of Land Required for New Residential
4,271	Acres of Existing Residential Development
<u>2,581</u>	<u>Acres of Land Required for New Residential</u>
6,852	Acres of Land Required for Residential Development

Industrial

To estimate the growth of industrial development, the base studies that the City of Janesville have developed will be used. Based on the city's study, it was estimated that 3 to 4 industrial projects would be started each year and that they would have an average size of 8 acres per project.

4	Projects started per year
8	Acres per project
30	Years in planning period 1990-2020

$$4 \text{ Projects} \quad * \quad 8 \text{ Acres} \quad * \quad 30 \text{ Years} \quad = \quad 960.00 \text{ Acres}$$

729.00	Acres of Existing Industrial Development
<u>960.00</u>	<u>Acres of Land Required for New Industrial</u>
1689.00	Acres of Land Required for Industrial Development

Non Manufacturing

To estimate the growth of commercial development, the base studies that the City of Janesville have developed will be used. Based on the city's study, it was estimated that 6790 new employees would be hired in the commercial sector for the 30 year planning period. It is also assumed that there would be 11.8 employees utilized for each acre of commercial development. Furthermore, it was assumed that 85.8% of the commercial development would be of a strictly commercial purpose. It was also assumed that the remaining 14.2% would comprise a Public or Quasi Public nature. It was further assumed that the Public or Quasi Public land use would be augmented by the addition of the Rock County Facility, which would comprise about 340 acres.

Commercial:

6,790 New employees 1990-2020

11.8 Employee/Acre Density

85.8% Ratio of Commercial to Total Non Manufacturing

6790 Employees/ 11.8 Employees/Acres * 85.8% = 494.00 Acres

766.00 Acres of Existing Commercial Development

493.71 Acres of Land Required for New Commercial

1,259.71 Acres of Land Required for Commercial Development

Quasi Public:

6790 New employees 1990-2020

11.8 Employee/Acre Density

14.2% Ratio of Public/Quasi to Total Non Manufacturing

340 Acres for County Complex

**6790 Employees/ 11.8 Employees/Acres * 14.2% +
340 Acres = 422 Acres**

Extraction

The estimate for land use for extraction purposes is assumed to remain the same as it was in 1990.

Land Use for Extraction

286.00 Acres Existing

Transportation, Communication, and Utilities

To estimate the growth of transportation development, the base studies that the City of Janesville have developed will be used.

Based on the city's study, it was estimated that 170 new employees would be hired in the commercial sector for the 30 year planning period. It is also assumed that there would be 3.5 employees per acre of this type of development.

374 New Employees 1990-2020
3.65 Employee/Acre Density

374 Employees/3.65 Employees/Acres = 102 Acres

493.00 Acres of Existing Transportation Development
102.00 Acres of Land Required for New Transportation
595.00 Acres of Land Required Transportation Development

Residential + Industrial + Commercial + Public/Quasi Public + Extraction + Utilities =

6,852 Acres + 1,689.00 Acres + 1,260 Acres + 1,143 Acres + 286.00 Acres + 595.00 Acres = 11,825.00 Acres

Parks and Streets

According to the City of Janesville study, the use of Parks, Recreation, Open Space, Streets and Parking Land Uses have been decreasing during the 1980s and 1990s. The City estimates that street usage will decline to 31% by 2020 and the usage of parks will decline to 19% by 2020. We will use these percentages for this report.

Streets	31.00 Percent of Developed Land
Parks	19.00 Percent of Developed Land
Total	50.00 Percent of Developed Land

Parks and Streets Land Use:

11,825.00 Acres	Proposed 2020 Land Use
7,266.00 Acres	1990 Land Use
4,559.00 Acres x	50.00% = 2,279 Acres
4,240.00	Acres of Parks and Streets in 1990
2,279.00	Additional Acres Required for the year 2020
6,519.00	Total Acres of Parks and Streets

Total Developed Area Land Use:

11,825.00 Acres + 6,519 Acres = 18,344 Acres

Undeveloped Land Use

The estimate for land that is covered by water is assumed to remain the same as it was in 1990

Water 400.00 Acres Existing

Undeveloped Land Usage will be calculated using the assumption that undeveloped land will maintain the existing ratio of 1990 agricultural/vacant acres to total developed 1990 city land area (or $3,529/11,506 = 0.31$). It is assumed that this ratio will remain constant over the 30-year planning period. Therefore, the acreage of agricultural and vacant land to be added is 0.31 multiplied by 6,838 acres (proposed growth est.), or 2,120 additional acres between 1990-2020. There is also an additional area of 400.00 acres of water that will remain unchanged.

18,344.00	Proposed Acres of Developed Land
11,506.00	<u>Acres of Existing Developed Land</u>
6,838.00	Acres of Proposed Growth

$$6,838.00 \text{ Acres} \times 31\% = 2,120 \text{ Acres}$$

Total Undeveloped Area Land Use

3,529.00 Acres + 2120 Acres = 5,649 Acres

Summary

Summary of Total Land Use Requirements:

Residential	6852.0 Acres
Industrial	1689.0 Acres
Commercial	1260.0 Acres
Quasi Public	1143.0 Acres
Extraction	286.0 Acres
Utilities	595.0 Acres
Parks and Streets	6519.0 Acres
Water	400.0 Acres
Vacant Lands	5649.0 Acres

Total 24,393 Acres or 38.11 Acres

APPENDIX C